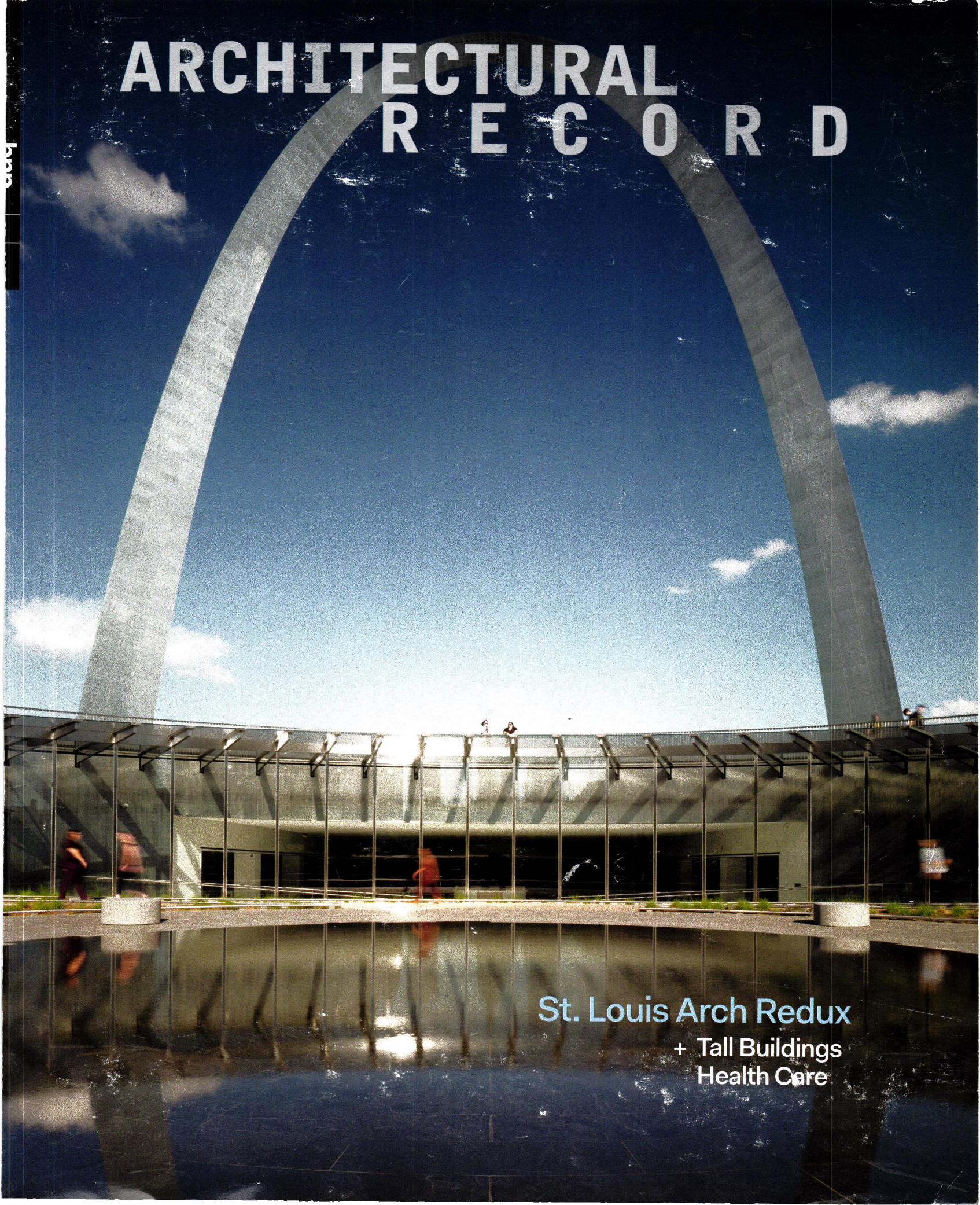
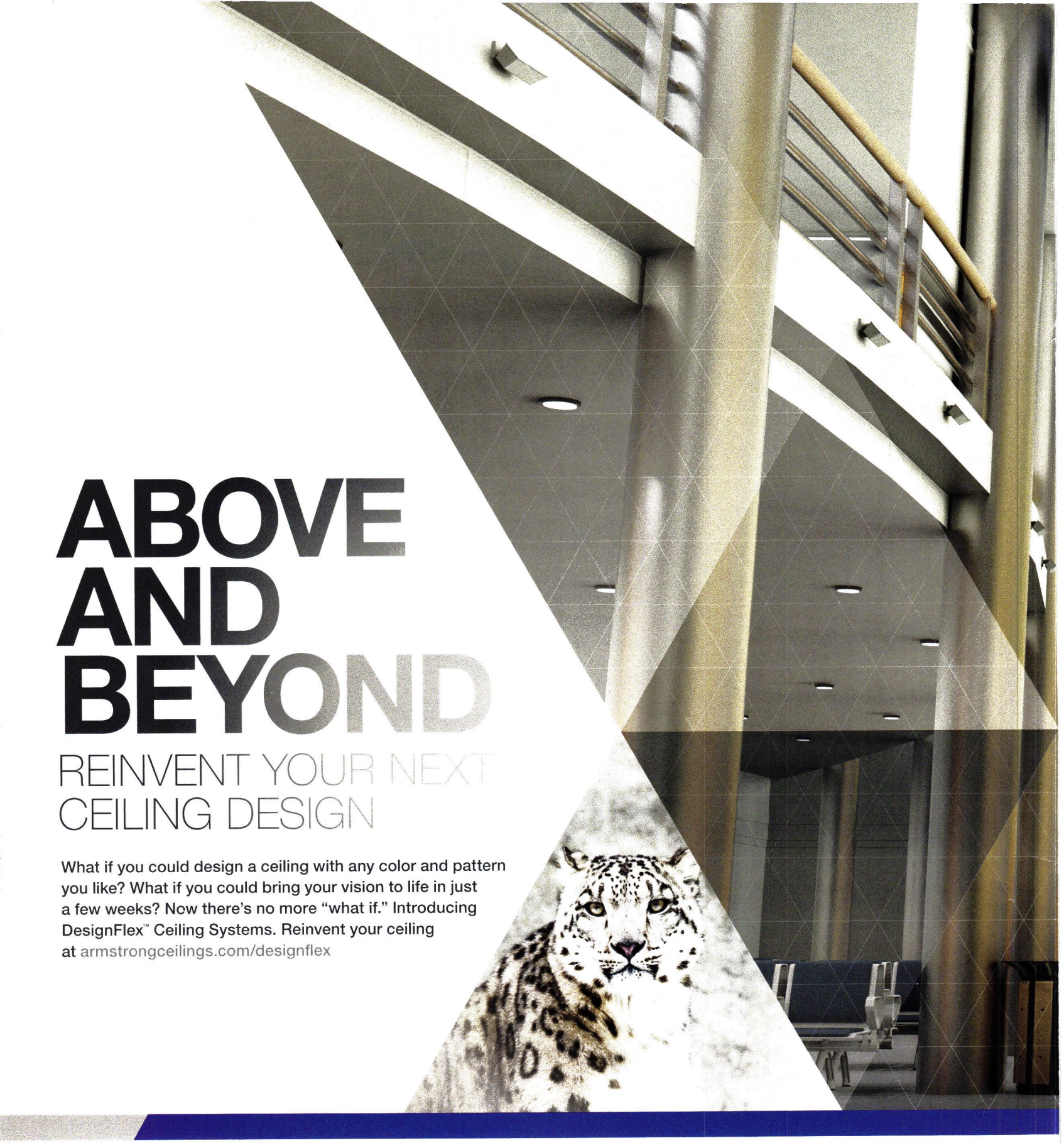
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St. Louis Arch Redux

+ Tall Buildings
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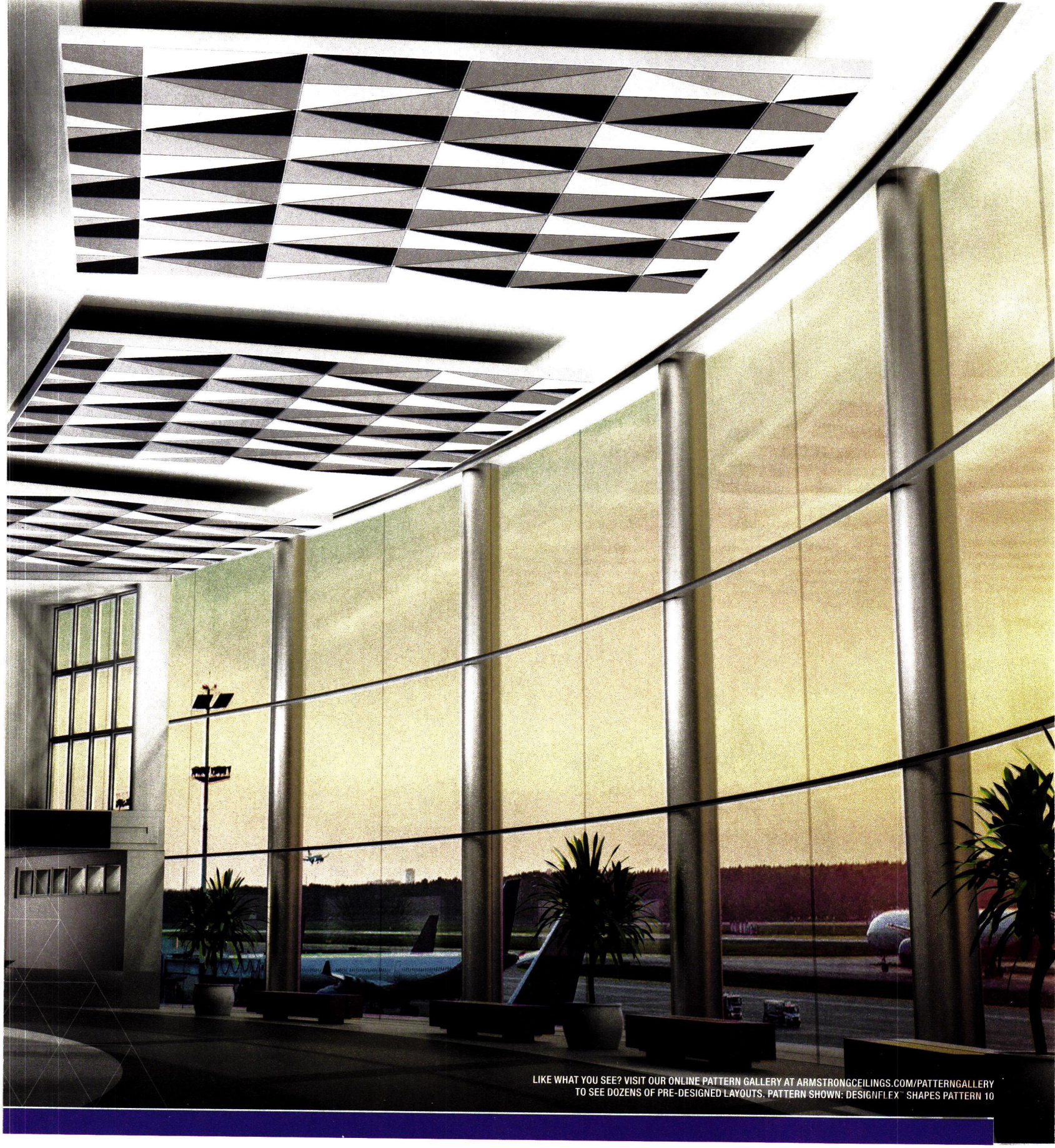


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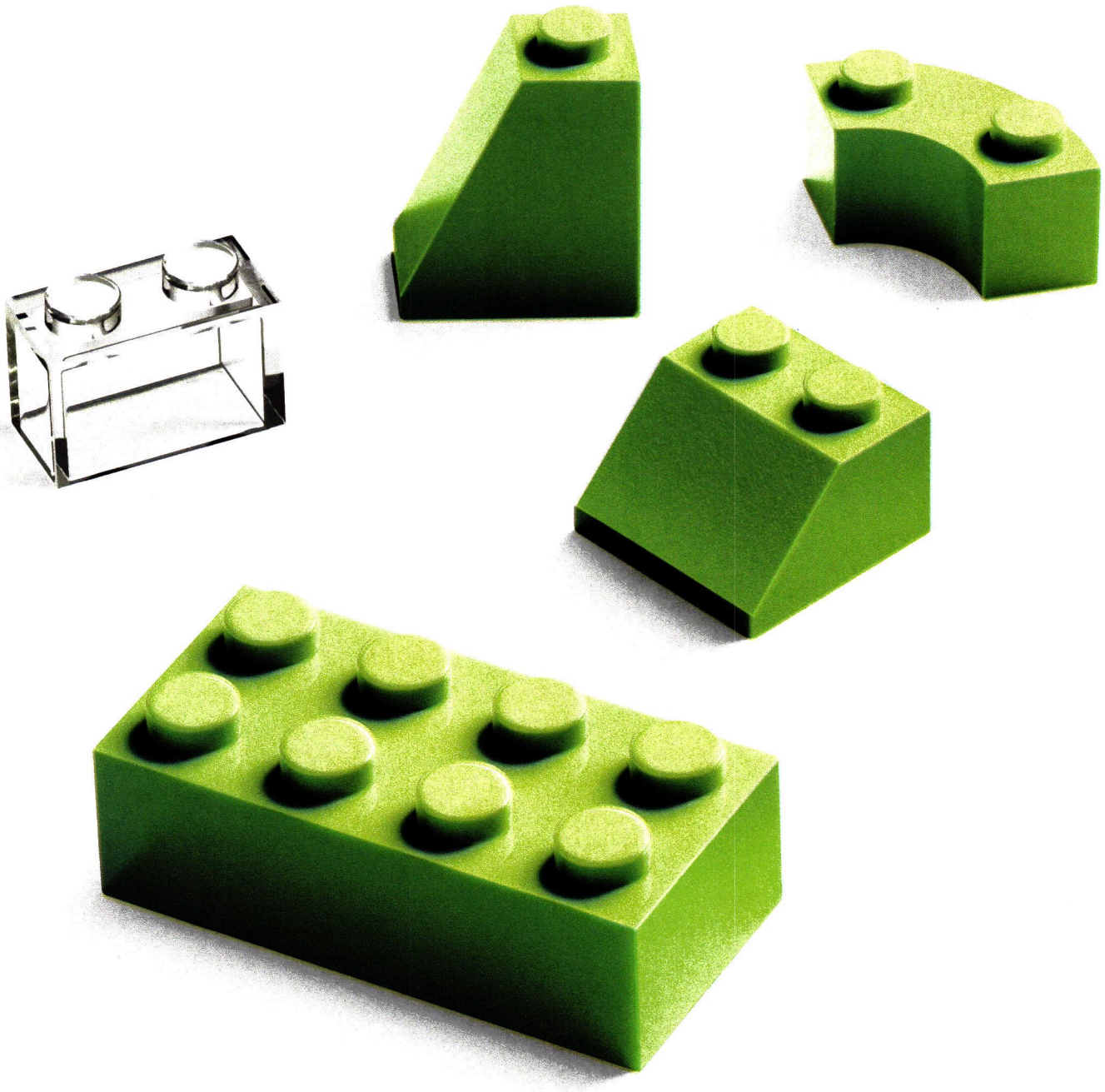
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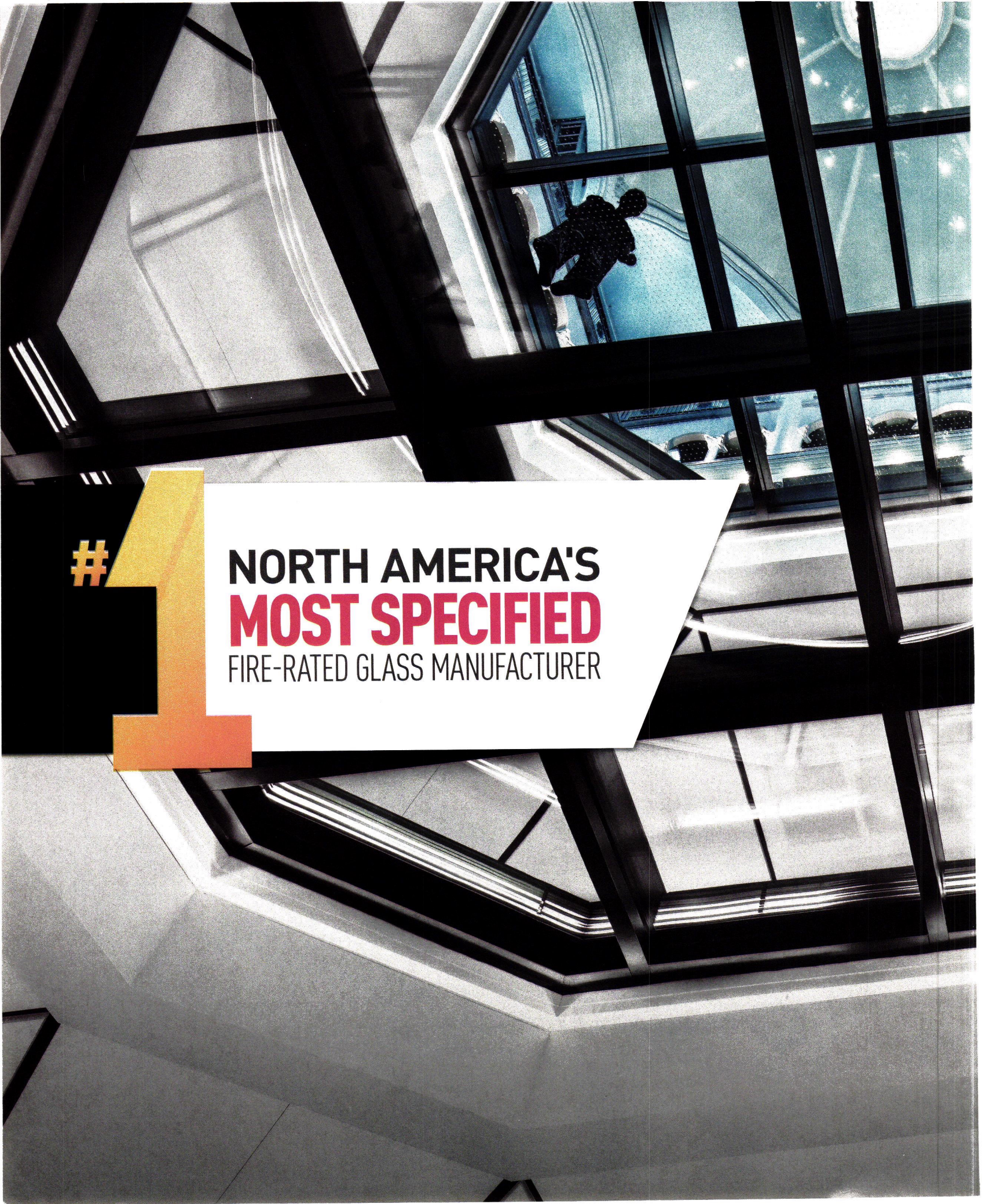
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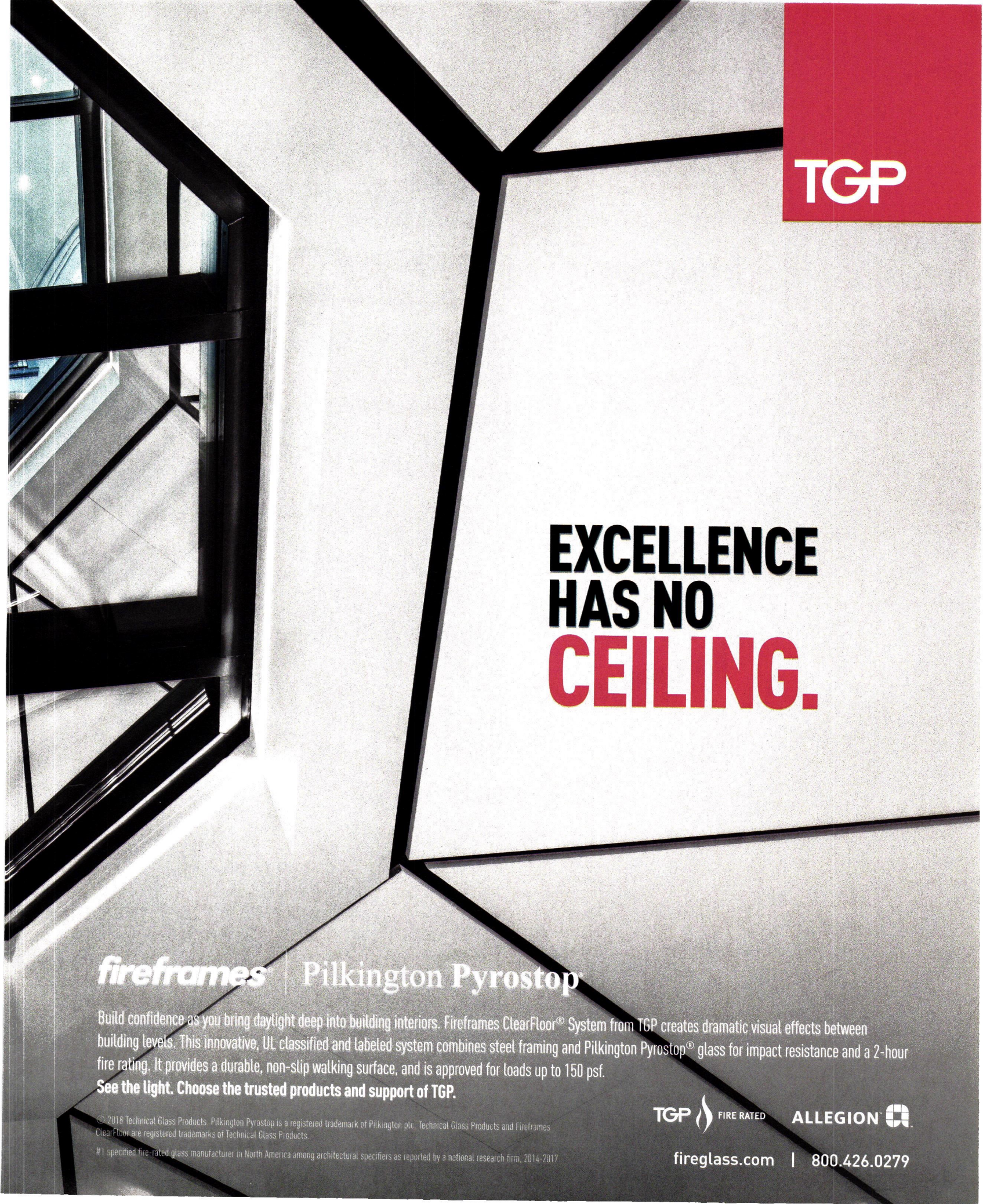
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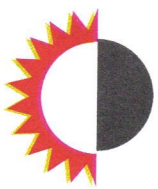

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Beyond the Glass


Photographer: Ryan Kurtz Photography

HOW PELLA ARCHITECTURAL SERVICES HELPED CREATE A MODERN MASTERPIECE.

River Birch House | Jose Garcia Design | Cincinnati, OH

Aiming to create a strikingly modern residence with narrow sightlines, expansive glass and natural materials, Jose Garcia Design turned to the Pella Architectural Support Services team. From preliminary drawings to installation advisory, Pella worked with the acclaimed firm and contractor to deliver solutions that met challenging design requirements – and created one of Cincinnati's most innovative structures.



JARON VOS
Manager, Architectural Services

AT THE DRAWING BOARD

Pella's experts started by drawing up plans for Garcia's extra-large window combinations. Using design parameters provided by structural engineers, the team developed several conventional mullion-reinforcing options that would withstand wind loads at spans greater than 14 feet.

"Conventional reinforcing options are too wide for a project like this, so the width of the mullions was very important," said Jaron Vos, manager of Architectural Services at Pella. "So we designed a one-inch custom extrusion that was deeper than the frame but could hold a narrow width."

A NEW USE FOR TRUCK BED LINER

A span this long required a unique solution. To obtain the right structural capacity, the depth of the aluminum extrusion needed to extend beyond the window frames and into the interior. This design presented the potential for condensation. And though the extrusion would be insulated by wood trim, the team wanted to be sure that condensation would not be an issue.

After utilizing thermal modeling and conductance testing, Pella's architectural engineers concluded that a coat of truck bed liner applied to the extrusion would solve the issue.

"It has durability and low thermal conductivity. Plus, it's thin enough to not interfere with the trim," Vos said. "Once the interior trim was installed, the condensation concern was alleviated."

SMART INSTALLATION PRACTICES

Because large combinations and custom extrusions were new to the installer, a field services specialist from Pella Architectural Support Services worked on-site to advise on the installation procedures.

"With specialized engineering, drafting, testing and field services, we can say 'yes' to an architect's vision, help contractors make those visions reality, and provide customers the looks and performance they want," Vos explained.

ARCHITECTURAL EXPERTISE FROM BEGINNING TO END

Design and performance analysis

Thermal analysis

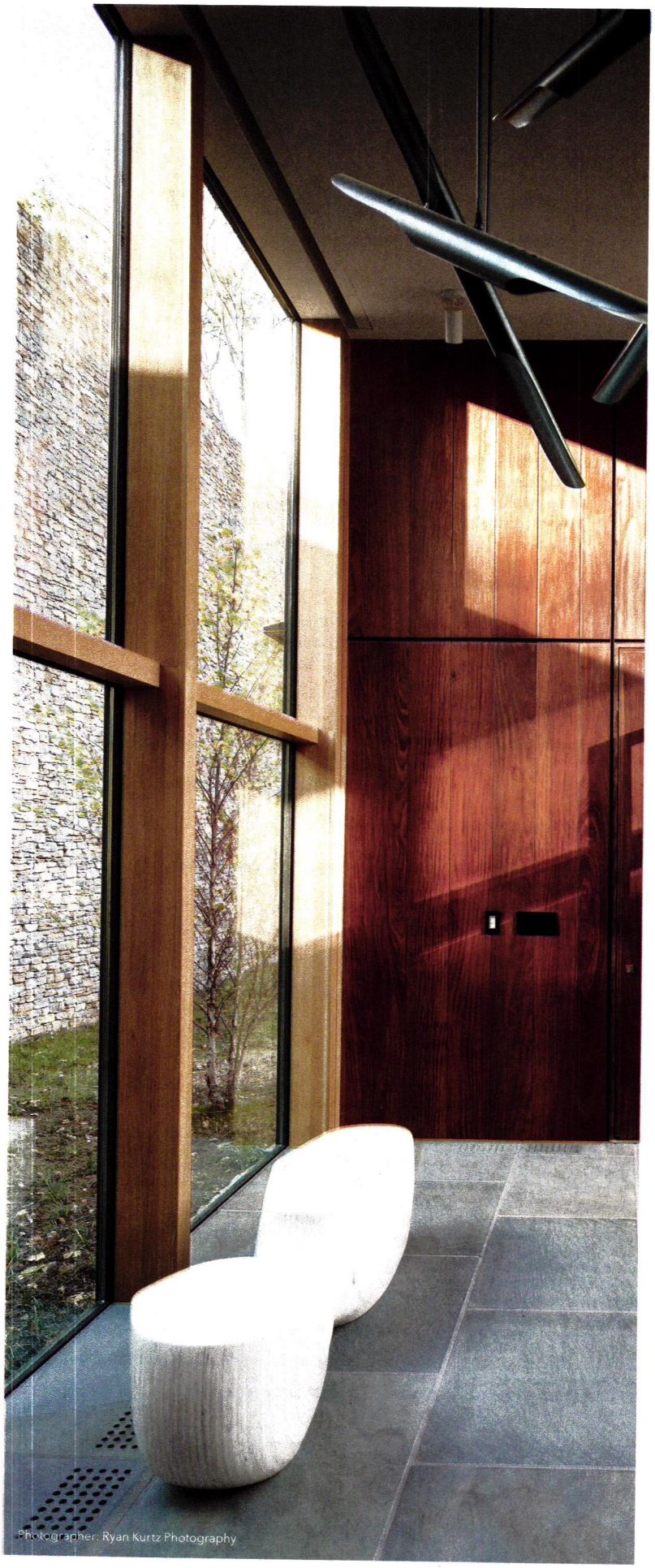
Custom extrusion design

Preliminary design drawings

Custom product design

Installation shop drawings

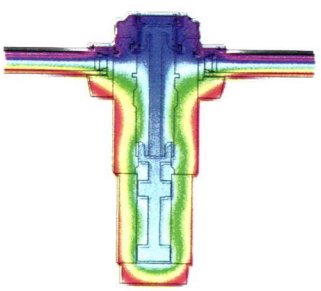
Field services and on-site training



We owe this project to one thing – truck bed liner.

When Jose Garcia Design needed a custom aluminum extrusion for their contemporary masterpiece, we were game. But Pella's thermal and performance analyses determined that condensation might be a problem. So the Pella Architectural Support Services team got creative, recommending a coating of truck bed liner to deliver a building envelope that exceeded performance requirements – and helped our client achieve their most ambitious goals.

FROM CONCEPT THROUGH COMPLETION.

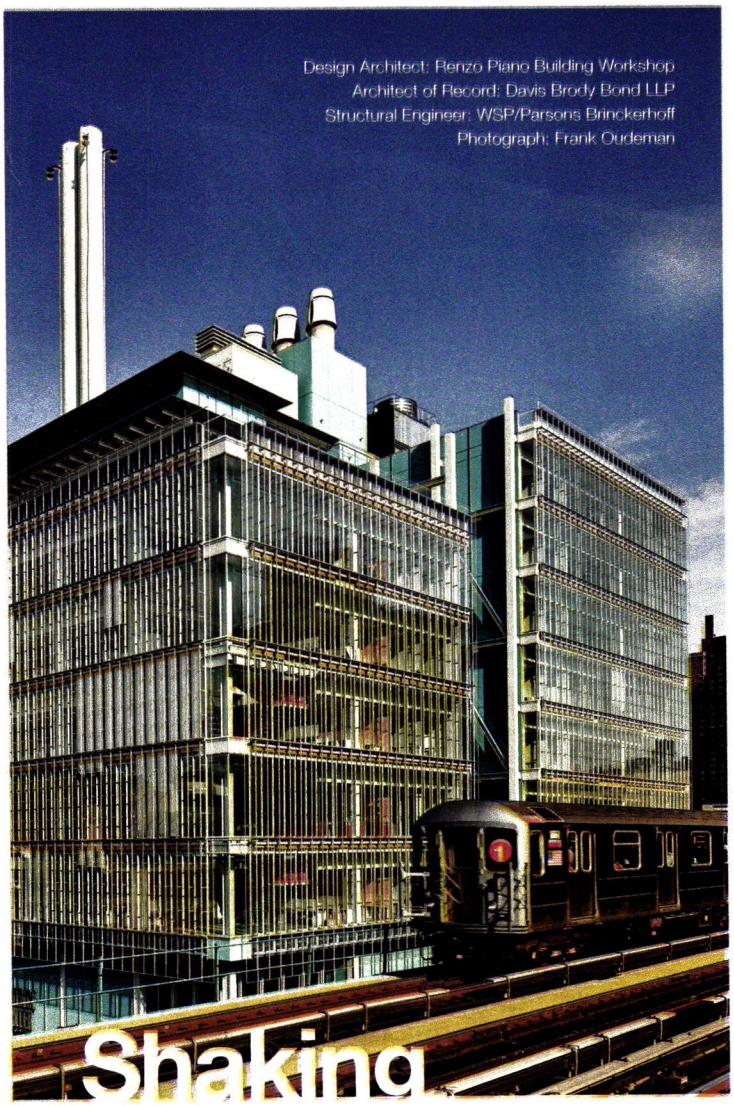


Thermal model represented is specific to this project.

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In New York, passing subways can shake entire buildings, but that wasn't an option for Columbia University's new **Jerome L. Greene Science Center**. Home to sensitive laboratory and imaging equipment requiring exceptional stability, the design by **Renzo Piano Building Workshop** relies on a steel structure to reduce floor vibrations to a miniscule 2,000 mips. Even as the elevated No. 1 train roars past, this helps ensure that nothing distracts from the scientific advances being made within the center's unshakable walls. Read more about it in **Metals in Construction** online.

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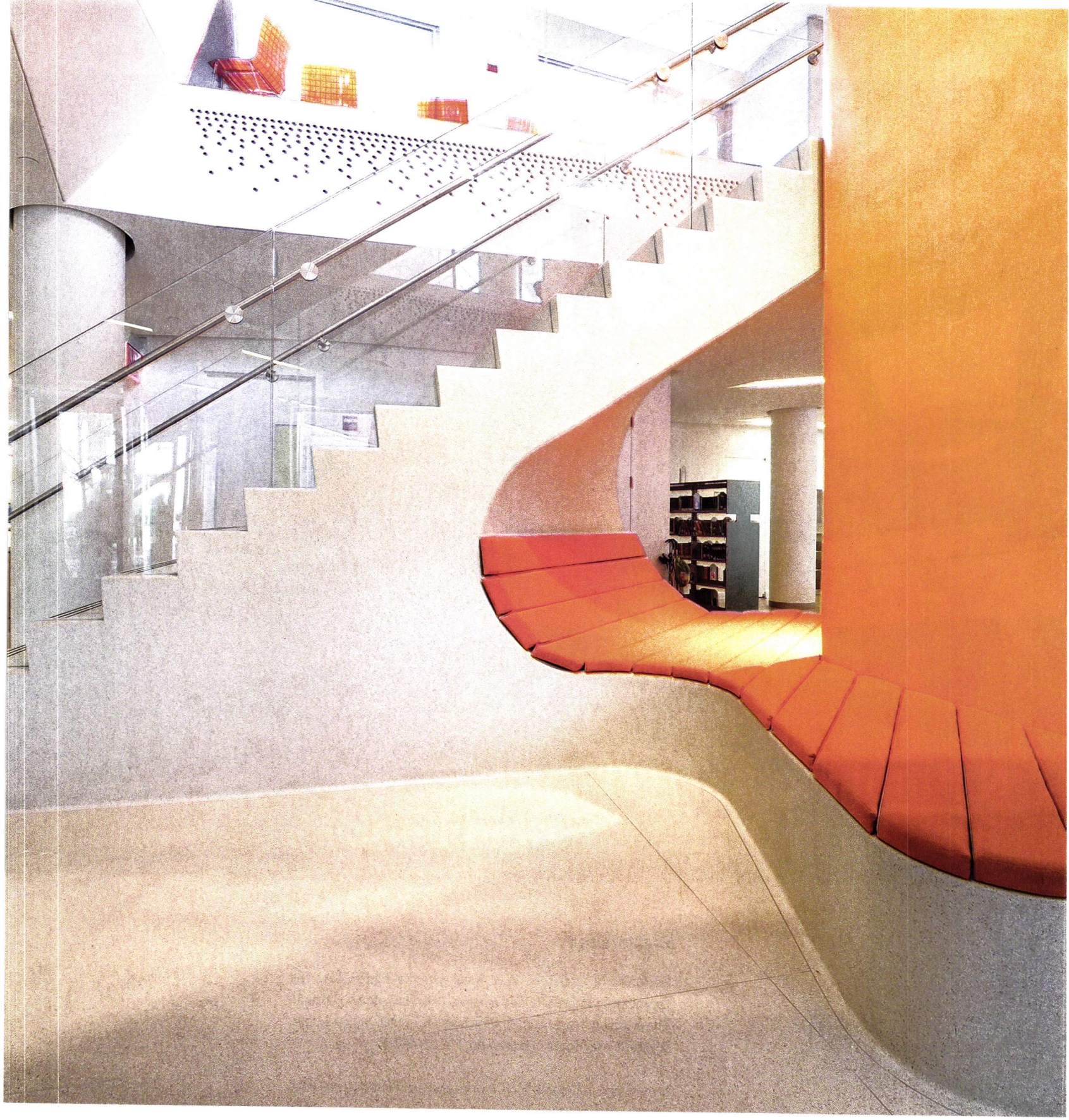
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Natural Light, Fresh Air Transform Office Building Lobby

When developers decided to renovate The Leamington Building in Oakland, California, they knew they wanted to update the old skylights to give the new communal space an open vibe.

Background

Designed by architect W.H. Meeks in the mid-1920s, The Leamington Hotel heralded a new era for downtown Oakland. The building went from luxury hotel to music venue before shuttering its doors in bankruptcy in the 1970s.

It reopened in the 1980s as offices and included stained-glass atrium skylights to provide light to the first-floor bank. With demand for office space from the tech industry, the building's owner, Harvest Properties, decided to remake the ground floor into a communal area where people can meet to grab a coffee or a bite to eat.



Historical postcard illustration of The Leamington Hotel

© 2018 VELUX Group

Challenge: Keeping the skylights without breaking the budget

Harvest Properties hired RMW architecture & interiors to open up the ground floor, where they envisioned a new dining and retail area. They knew natural light would create the ambiance they desired.

"We saw great potential for the lobby area, so we removed the cubicles and opened up the space," said Shane Gilroy with Harvest Properties. And while they knew replacing the old skylights was a project must-have, they worried that replacing them could be both expensive and time-consuming.



The Leamington's original stained-glass skylights

Solution: VELUX Modular Skylight System – ridgelight



VELUX Modular Skylight System – ridgelight

Burlingame, California-based Crown Sheet Metal & Skylights bid three skylight options: a custom glass skylight, a fiberglass skylight system and the VELUX Modular Skylight System.

"It was a simple choice for them to save money and go with VMS," said Don Dennehy Jr. of Crown Sheet Metal. "The VMS system comes with all the performance — the operables and the shades — and a price that is 20 to 30 percent cheaper than custom skylights."

The new skylights feature rain and wind sensors and energy-efficient, loE, Argon gas-filled glass, tempered over laminated OSHA-rated, high-efficiency glazing. "The cost to do a custom skylight would have been much more expensive. This system was panelized and everything was numbered," said Billy Keller with Charles Pankow Builders Ltd.

Quick installation: 72 modules in just four days

Crown Sheet Metal installed the VMS ridgelights in four days, much faster than a custom installation. They used custom-sized modules to fit the original skylight openings, and each ridgelight has venting modules to provide cooling airflow to the lobby below.

After removing the old glass skylights and framing, Crown Sheet Metal did some infill on the existing curb and added an I-beam rail. They installed the VMS ridgelight framing system and then they were ready to snap the VMS units into place.



Due to limited rooftop space, a spider crane was used to maneuver the modular units into the ridgelight frames

An open, airy lobby

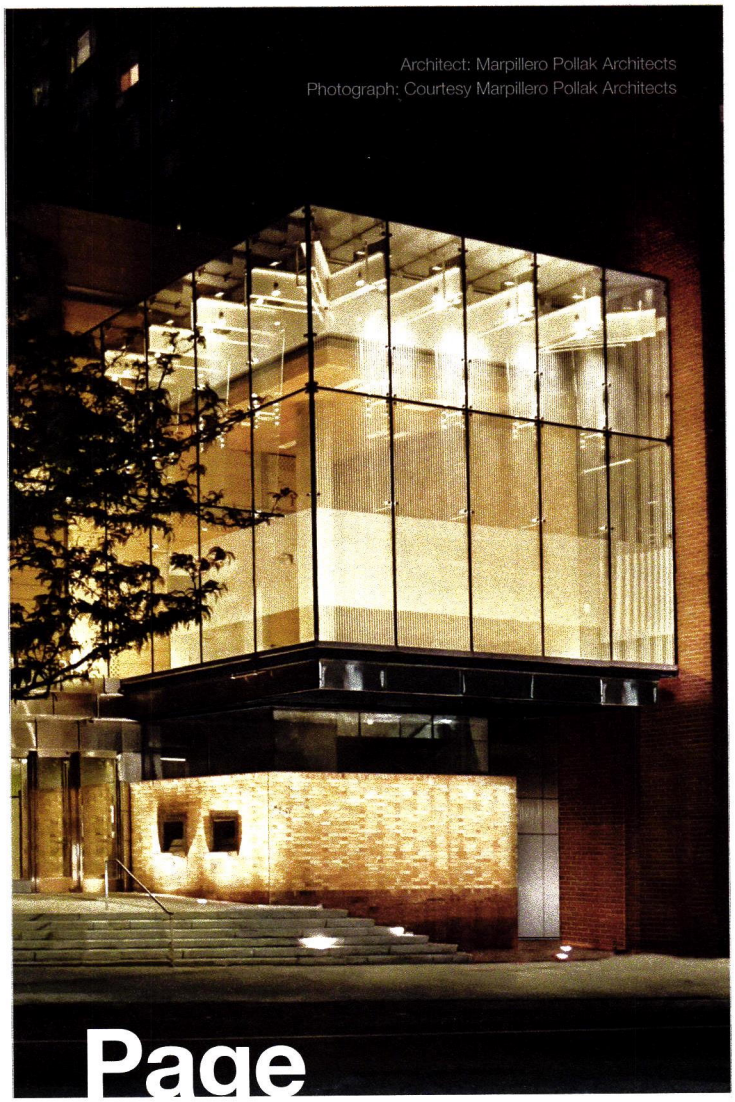


The lobby has been transformed into a light-filled gathering space with restaurants, businesses and an open meeting space. And the ventilating units give building operators a way to cool the space.

"Yesterday it was 85 or 90 degrees outside and the security guard in the lobby had the skylights open," Gilroy said. "It brings in fresh air that cools the space. They'll crack them open when it's really hot."

Visit **skylightoffers.com/vms** for CAD/BIM files, technical specs and installation videos.

VELUX®
Skylights



Page Turner

Queens' new **Elmhurst Community Library** serves one of the most diverse and vibrant communities in New York. Designed by **Marpillero Pollak Architects**, the LEED Silver-rated facility features two structural glass-encased reading rooms that allow light to flood in during the day and offer glimpses of the state-of-the-art library setting at night. Erected by **W&W Glass**, its glazed features have become beacons for the community, drawing its knowledge-hungry members to the wealth of information within. Read more about it in **Metals in Construction** online.

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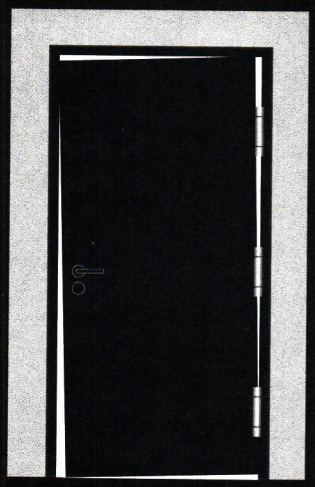
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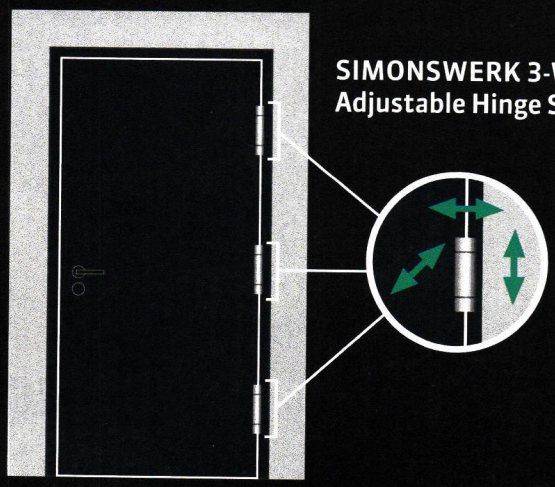
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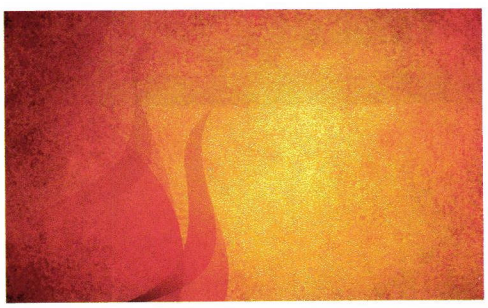
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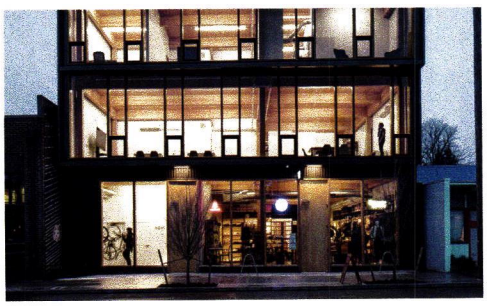


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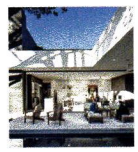
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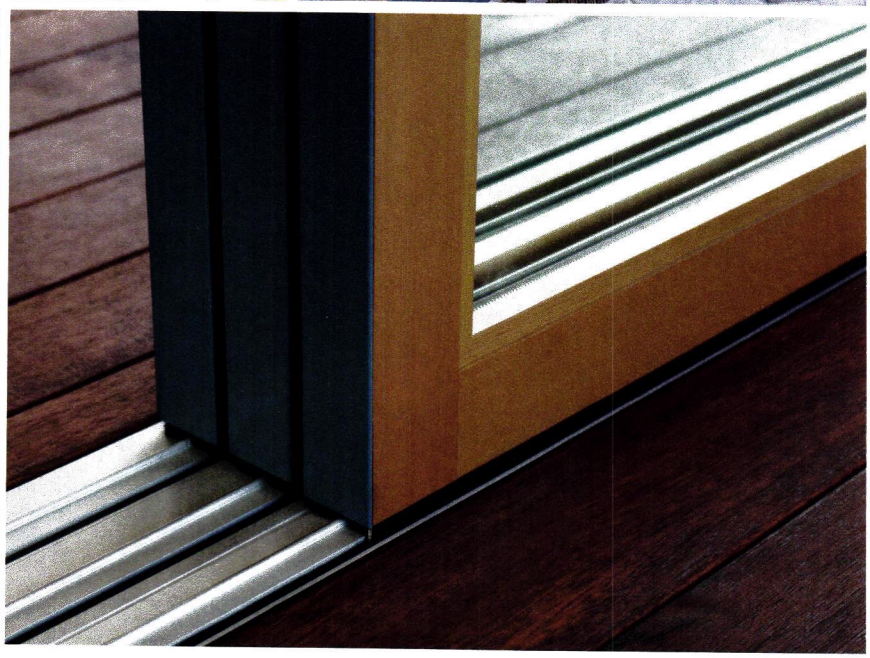
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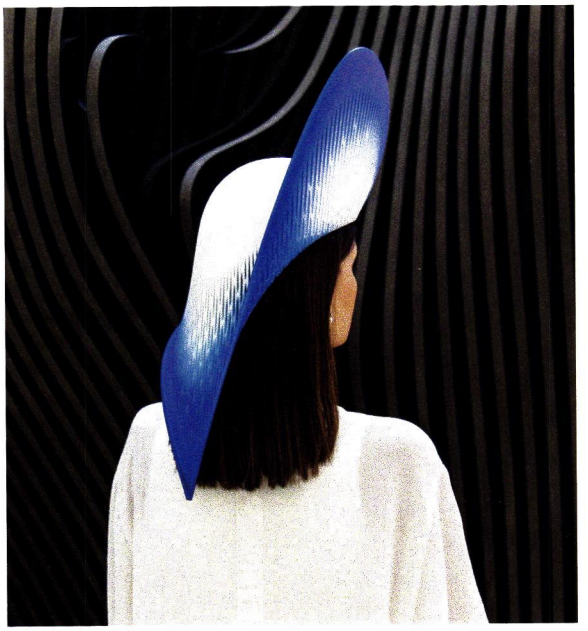
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Beyond the printed page: highlights from our website, live events, and other happenings.



ART MEETS BRICK

Icelandic-Danish artist Olafur Eliasson's first building was completed last month in Vejle, Denmark, by the architectural team within his eponymous studio. The 92-foot-high glazed-brick structure houses the headquarters of Kirk Kapital. [NEWS]



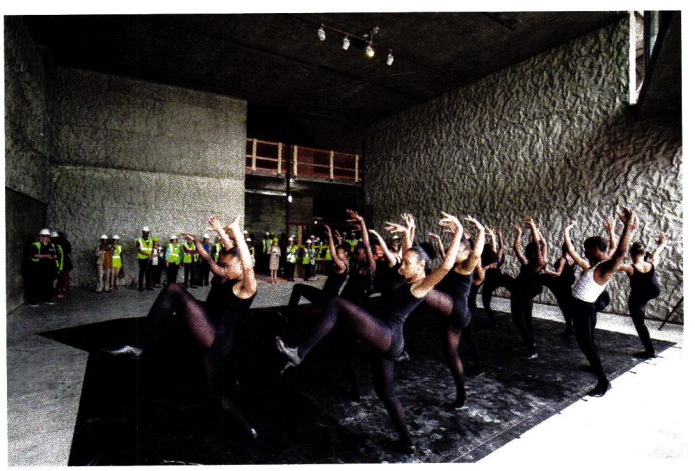
NEIGHBORLY FASHION

Zaha Hadid Architects designed the H-Line hat in support of a fundraiser for the nonprofit group Friends of the High Line, which runs the elevated New York park. ZHA drew inspiration from the undulating facade of its new luxury multifamily project that overlooks the former rail line. [INSTAGRAM]



A HIGHER PLANE

While visiting the new Gateway Arch National Park and expanded museum in St. Louis (page 61), features editor Josephine Minutillo took to the sky with Eric Moraczewski, executive director of the Gateway Arch Park Foundation. [FIRST LOOK]



CONSTRUCTIVE PERFORMANCE

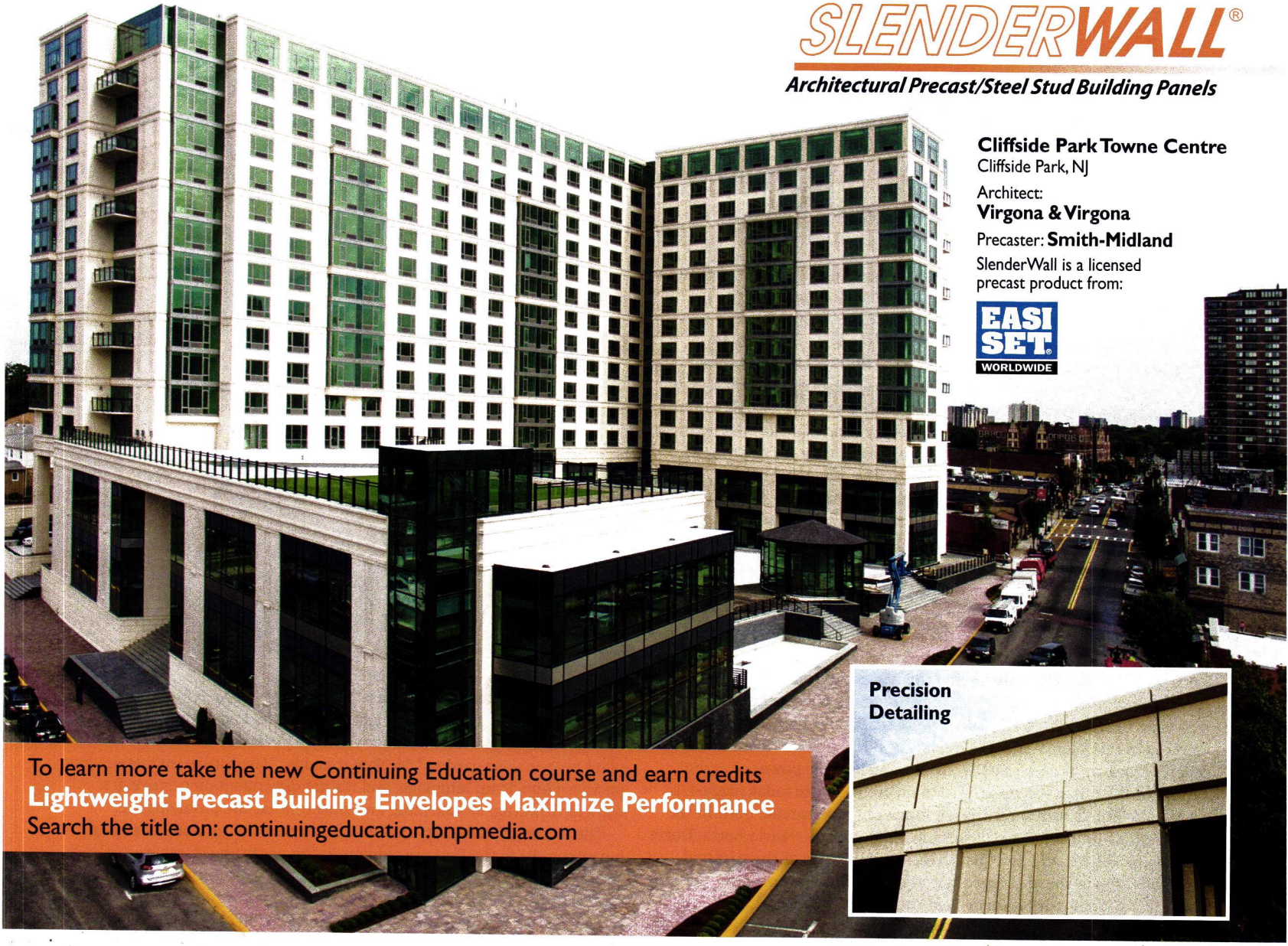
Last month, visitors to the John F. Kennedy Center for the Performing Arts got a sneak peek at Steven Holl Architects' expansion, the REACH, opening fall 2019. The site tour included a dance performance inside the dramatic Skylight Pavilion. [NEWS]

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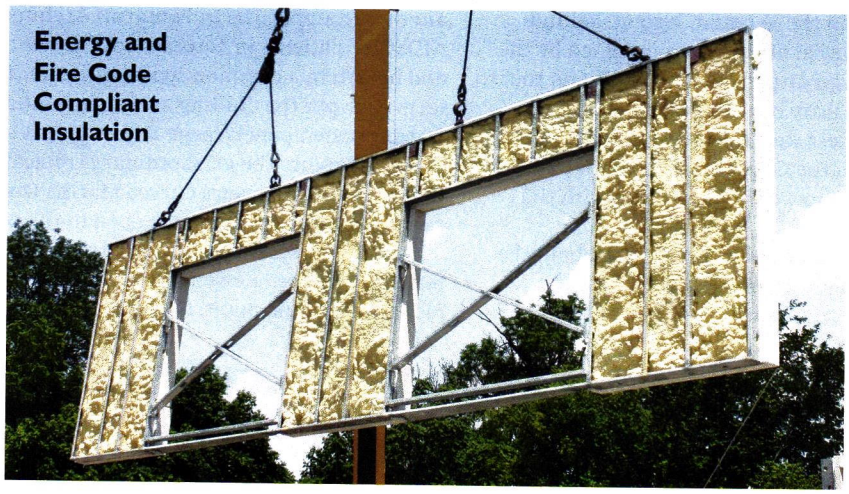
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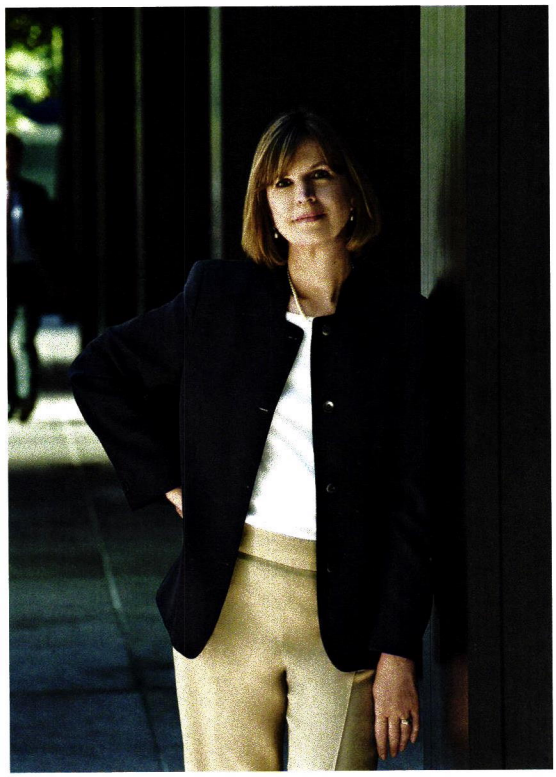
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Experiencing Free Space

At this year's kinder, gentler Venice Biennale, the curators celebrate a generosity of spirit.



THE 2018 edition of the Venice Architecture Biennale, which opened in May and runs through November, is as much about attitude as architecture. The curators, Yvonne Farrell and Shelley McNamara, cofounders of Grafton Architects in Dublin (and the first female duo to run the much-touted exhibition), set forth the 2018 theme as "Freespace"—a spongy notion they describe as "a generosity of spirit and a sense of humanity at the core of architecture's agenda, focusing on the quality of space itself." And they mean every kind of space: the manifesto, as they call it, goes on to celebrate the capacity to find "unexpected generosity in each project—even within the most private, defensive, exclusive, or commercially restricted conditions." Infusing that kind of generosity could be a tall order for an architect working for a client who calculates the program and price of a project down to the square inch. But looking beyond such quotidian realities, the exploration of ideas and ideals is their point: "'Freespace' encompasses freedom to imagine, the free space of time and memory, binding past, present, and future together . . . weaving the archaic with the contemporary."

Weaving the archaic with the contemporary is typically the experience of the Venice Biennale: seeing the newest architecture within the golden aura of that historic city. Some observers have complained, however, that visions of the future were strangely absent from the exhibition this year. While calling it a "kinder, gentler" Biennale, critic Joseph Giovannini decries its failure to consider the power of digital design or the impact of globalization on architecture today (page 47).

But a poetic thread ran through much of the Biennale, both in the installations by architects the curators had invited—Mario Botta, Dorte Mandrup, SANAA, to name just three—and in a few of the national pavilions, which the curators did not, by tradition, oversee. Yet perhaps the best national exhibition evoked the theme of Freespace with particular clarity and beauty. The Vatican, in its first foray to the Biennale, commissioned 10 chapels by 10 firms, setting them in a small park on the island of San Giorgio Maggiore in the Venetian lagoon, behind Palladio's great church. The most lyrical of these was designed by the Brazilian architect Carla Juaçaba, who dispensed with walls and roof to leave the visitor sheltered only by a leafy bower of trees, sitting on a slender, low beam of polished stainless steel, facing a stainless-steel mast with a cross beam to represent the Christian symbol. In its elegant minimalism, it indeed seemed to weave the archaic with the contemporary.

I caught up with Farrell and McNamara in Venice to talk about the ideas of past, present, and future that they unpacked at the Biennale. "Time in architecture is not linear. The ancient and the contemporary are very close," said McNamara.

"The conversation between the architect and the current human being is an active conversation—and the architect might be dead," Farrell said, calling the theme of Freespace a "fishing net" that can hold all sorts of disparate ideas at once. "We're not putting up solutions for the future, except to say that sensitivity matters and that everything we do as architects matters, whether you read poetry or listen to Bach—or plant peas in your garden." McNamara adds, "The future isn't dependent on an architectural language, and it's not dependent on gesture. It's ways of thinking, of analyzing and stating what the problems are."

The values of sensitivity and humanity that Farrell and McNamara have brought to the fore are evident in the pages ahead, where we look at health-care facilities, notoriously challenging buildings, with extensive technical requirements. But even the remaking and expansion of a large urban medical campus by Ennead and NBBJ (page 118), incorporates such "free space" as gardens and courtyards within a tight site. In another example, Hariri Pontarini Architects designed a clinic for AIDS/HIV patients in Toronto, with domestic touches, like a fireplace and hearth in a common space, while, in the patient rooms, the architects have put the chilling array of essential medical equipment behind warm wooden panels (page 126). And in a special feature on tall buildings, we explore the extraordinary tropical garden at the center of Christoph Ingenhoven's curved Marina One tower in Singapore—a calm, somewhat cool respite, open to the public.

Despite the scale and complex requirements of such works of architecture, they are in essence human-centered, with, as Farrell and McNamara would put it, free spaces that express a generosity of spirit.

Cathleen McGuigan

Cathleen McGuigan, Editor in Chief

PHOTOGRAPHY: © MICHEL ARNAUD



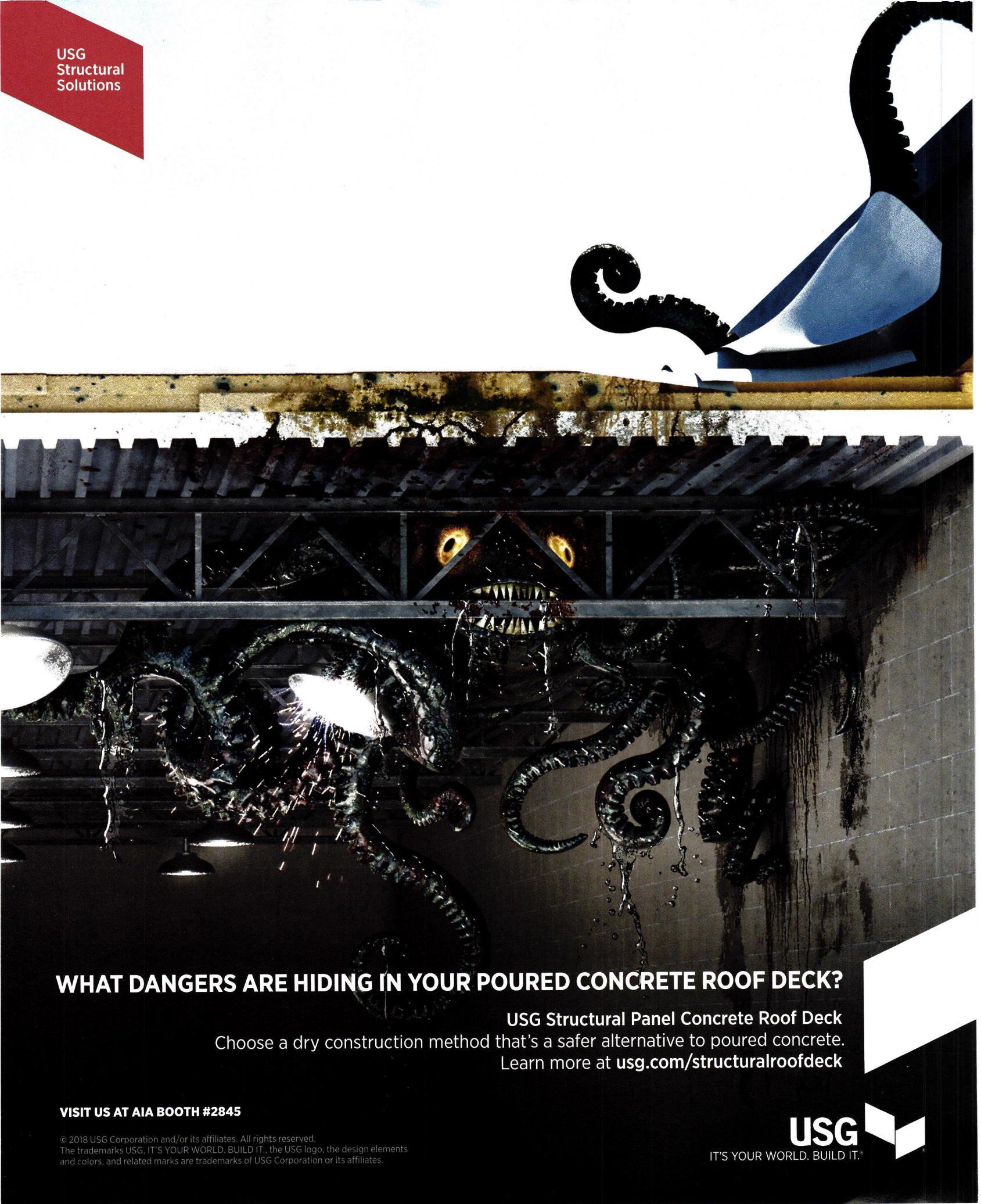
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Left, Located on Barrington Avenue, in West Los Angeles, Shubin + Donaldson Architects, Inc. used Fortina as a visual element to revitalize the façade and create a fresh architectural identity to this existing brick warehouse. Fortina Louvers in Aging Metal finish.

Above, a few of the profiles in Vent Walnut, Earl Walnut and Rokko Cedar.

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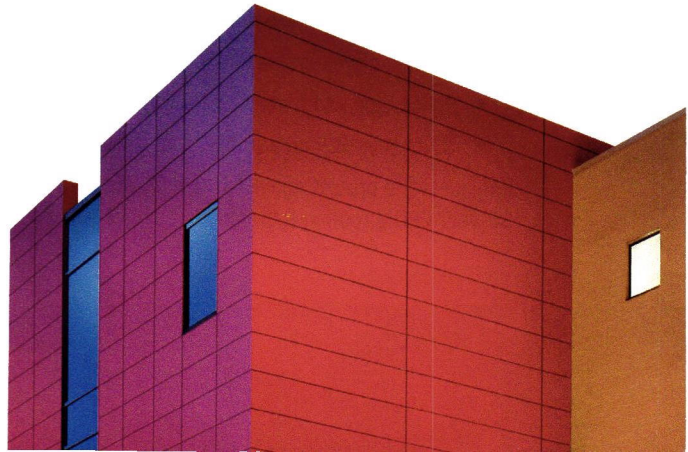
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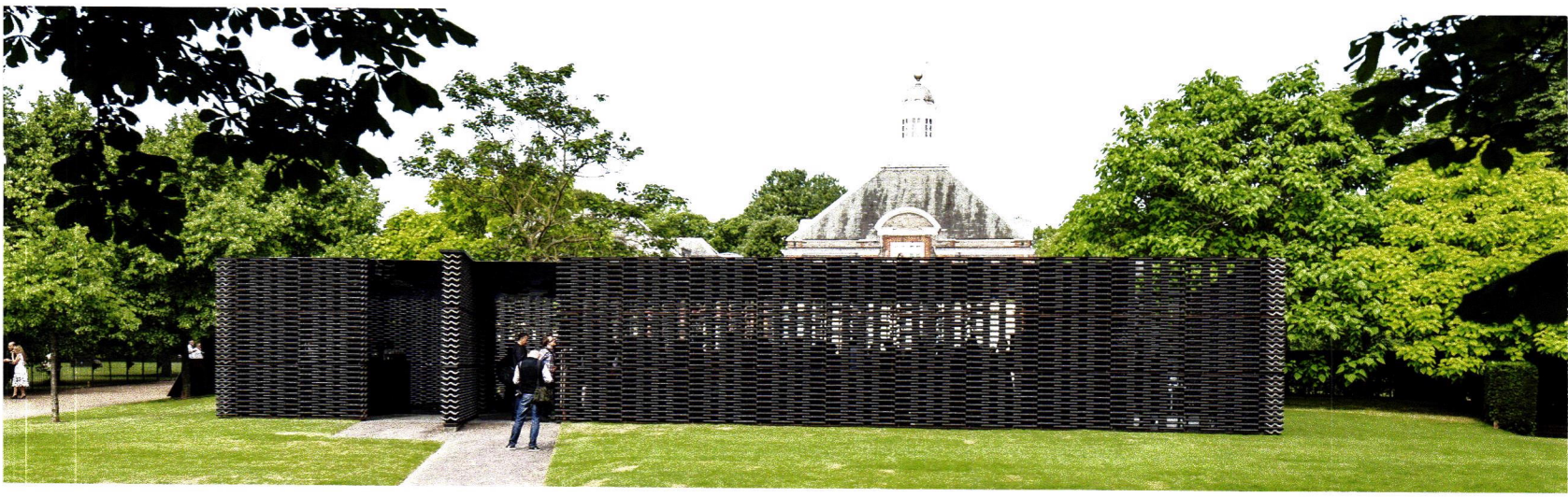
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perspective

I think that troubled cities often tragically misinterpret what's coolest about themselves . . . They miss their biggest, best, and probably most marketable asset: their unique and slightly off-center character.
—the late Anthony Bourdain, after visiting Buffalo, Detroit, and Baltimore for an episode of his show No Reservations *called "The Rust Belt."*



Frida Escobedo's Serpentine Pavilion Explores the Passage of Time

BY CHRIS FOGES

STANDING IN her 2018 Serpentine Gallery Pavilion on the green of London's Kensington Gardens, Mexican architect Frida Escobedo recalls the start of the project just six months ago: she received an e-mail with the subject line "Invitation" and assumed it was an offer to join the gallery's mailing list. "After the shock faded," she laughs, "we began working through many iterations to find something that hadn't been done before."

Seventeen other pavilions have occupied the gallery's lawn, by architects such as Zaha Hadid and Frank Gehry. At 38, Escobedo is the youngest yet, and her appointment reflects an ambition in recent years to showcase "architects of global promise, rather than global prominence," notes gallery CEO Yana Peel.

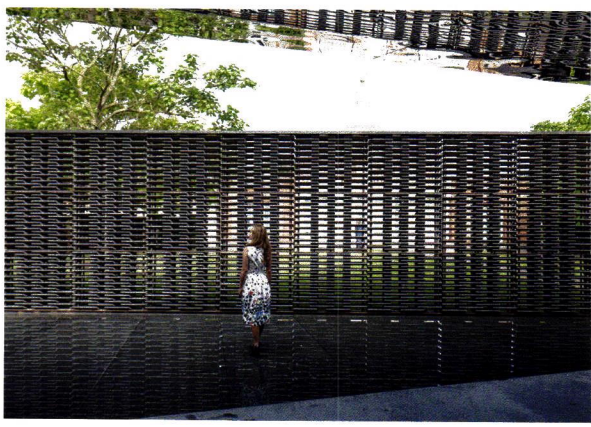
All architects get the same brief: the temporary structure should cover at least 3,230 square feet, accommodate a café, and host diverse events. Another implied condition: the buildings will have a second life elsewhere.

For Escobedo, "resolving the contradiction" of a building that will exist in a specific location for four months, and then at an unknown location for an uncertain duration, allowed her to draw on her own preoccupations: the capacity of buildings to register the passage of time, and the idea, drawn from philosopher Henri Bergson, that duration shapes perception of ourselves and our environments.

A rectangular enclosure, with entrances at opposite corners, the pavilion sits parallel with the gallery's eastern facade, to underscore its site-specificity. This form is intersected by a second rectangle, implied by a staggered array of cross walls, a trapezoidal pool, and the roof canopy, which is rotated to align due north, making a conceptual link to the Prime Meridian.

The pavilion's "dual nature" is developed further in its construction. Its rough screens are inspired by the breeze walls found in Mexican residential architecture, but built from a custom-made version of the cement roof tile common to ordinary British houses, and threaded onto vertical steel poles. "We wanted to use something modular, industrially produced, and not too heavy, which would age and weather well," says Escobedo. "Roof tiles made perfect sense."

While some of this embodied thinking will only be apparent from the posted explanatory notices, every visitor will experience the spatial and visual complexity that Escobedo has conjured from simple means. External walls shift between opacity and semitransparency, depending on the angle of approach. Inside, the small building is almost mazelike, and the figures of people passing between partitions dissolve into indistinct blobs of color, before reappearing in distorted reflection on the curved canopy overhead.



Small changes in the light and weather over time produce innumerable shadow effects on the textured walls of the pavilion, due to the undulating profile of each tile (both).

Between the tiles, the steelwork skeleton is already beginning to rust, a nod to the pavilion's afterlife. "A building is never finished," says Escobedo. "Architecture is a process, which continues until the object is a ruin." While some predecessor pavilions seemed to be the summary of a life's work, this beguiling structure feels like the start of a journey, for both the architect and her building. ■

PHOTOGRAPHY: © NORBERT TUKAJ

Visit our online section, architecturalrecord.com/news.

Top 300 Firms: Gensler Leads the Pack for Seventh Consecutive Year

BY MIRIAM SITZ

WHILE THE RANKINGS shuffled this year for many of the Top 25 firms in ARCHITECTURAL RECORD's annual list, the No. 1 firm held fast to its position at the top. With nearly $1.2 billion in total revenue in 2017—more than twice that of any other company on the list—Gensler cinched the top spot for the seventh year running. Despite reporting a slight dip in revenues from the previous year, Perkins+Will moved into second place, bumping AECOM, whose revenues also fell, to third.

The annual list, compiled by RECORD's sister publication *Engineering News-Record* (*ENR*), ranks companies by their architectural revenue from the prior year, as reported to *ENR* by firms that choose to participate.

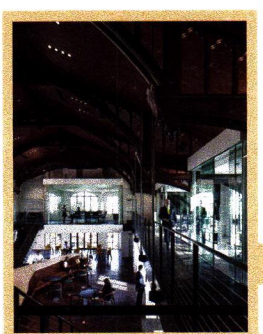
Gensler co-CEOs Diane Hoskins and Andy Cohen highlight an "understanding of the connection between design, business, and the human experience," along with a commitment to employees and work culture, as essential to robust growth.

Perkins+Will CEO Phil Harrison identifies global diversification, research, leadership development, and technology integration as keys to the firm's success. These factors reinforce each other, he says, and, as a result, "the best clients in the world want to work with us."

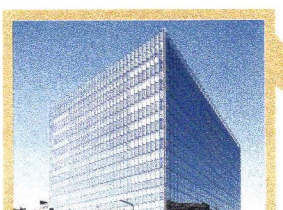
AECOM's Michael Chee, director of external communications, comments, "The impact on our ranking, based on year-over-year revenue, is nominal, as ours has remained steady."

Minneapolis-based Cuningham Group Architecture moved into the Top 25 on this year's list, jumping from 38th in 2017. Timothy Dufault, FAIA, president and CEO of the 50-year-old firm, attributes that success to a "dedicated focus on our expertise," strong sales and a strong economy, and, most importantly, he says, "a talented team that works tirelessly while staying committed to design excellence."

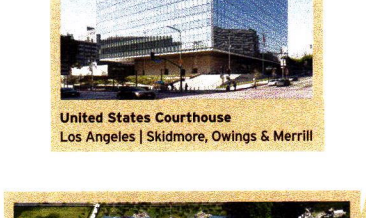
See the chart below for a list of the Top 25 firms, with their most recent annual architectural revenue listed in millions, along with photographs of new and notable projects by some of them. ■



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Glendale, California | Gensler



United States Courthouse
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Charter Oak International Academy
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TOP 25 U.S. ARCHITECTURE FIRMS OF 2018

Companies are ranked by revenue (in **millions of dollars**) for architectural services performed in 2017. These data also appear in ENR's Top 500 Design Firms list, which, unlike our ranking, also includes firms that do engineering exclusively. Find the full Top 300 Firms list on architecturalrecord.com.

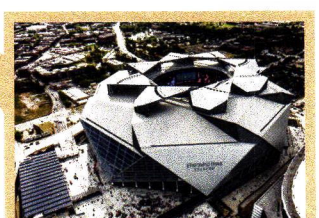
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2	3	**Perkins+Will** Chicago	A	$551.40
3	2	**AECOM** Los Angeles	EAC	$533.80
4	4	**Jacobs** Dallas	EAC	$431.32
5	6	**HKS** Dallas	A	$408.60
6	5	**HOK** St. Louis	AE	$407.34
7	8	**HDR** Omaha	EA	$401.80
8	9	**IBI Group** Toronto	EA	$307.10
9	10	**Stantec** Irvine, California	EAL	$304.53
10	12	**Skidmore, Owings & Merrill** New York	AE	$249.00
11	11	**Arcadis North America/CallisonRTKL** Highlands Ranch, CO	EA	$241.00
12	13	**Perkins Eastman** New York	A	$225.00
13	14	**Corgan** Dallas	A	$196.44
14	15	**CannonDesign** Grand Island, New York	AE	$191.40
15	17	**NBBJ** Seattle	A	$167.92
16	18	**Kohn Pedersen Fox Associates** New York	A	$166.70
17	19	**Leo A Daly** Omaha	AE	$164.80
18	22	**ZGF Architects** Portland, Oregon	A	$159.45
19	16	**Populous** Kansas City, Missouri	A	$158.49
20	21	**SmithGroupJJR** Detroit	AE	$157.81
21	23	**DLR Group** Minneapolis	AE	$155.60
22	25	**HGA** Minneapolis	AE	$122.47
23	27	**EYP** Albany, New York	AE	$109.14
24	30	**Gresham, Smith and Partners** Nashville	AE	$103.09
25	38	**Cuningham Group Architecture** Minneapolis	AE	$100.82

Key to firm types

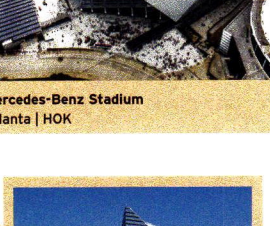
A Architect
AE Architect Engineer
AP Architect Planner
EAL Engineer Architect Landscape
AEC Architect Engineer Contractor
(not all combinations listed)



Whitman-Walker Health
Washington, D.C. | Perkins+Will



Mercedes-Benz Stadium
Atlanta | HOK



10 Hudson Yards
New York City | Kohn Pedersen Fox

PHOTOGRAPHY (CLOCKWISE FROM TOP, RIGHT): © ERIC LAIGNEL; COURTESY AMB GROUP; MICHAEL MORAN; ANDREW RUGGE/PERKINS EASTMAN; BRUCE DAMONTE; RYAN GOBUTY/GENSLER

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Design-Build Giant Katerra Acquires Architecture Firms

BY RANDY GRAGG

IN THREE short years, the design-build firm Katerra has grown from a Silicon Valley entrepreneur's bright idea into what could become one of the largest commercial/residential design-build firms in the country. The strategy: vertically integrate every layer of construction, from architecture to the fixtures and subcontracting, in order to lower costs, build faster, and raise quality. The means: venture capital (over $1 billion so far) plus acquisitions of existing companies in the building and products industry.

Now Katerra is moving to buy architecture firms. In May, it acquired the mass timber innovator Michael Green Architecture of Vancouver, with a staff of 25. In June, Lord Aeck Sargent joined Katerra's ranks with 160 people and six offices sprinkled from Atlanta to Ann Arbor, Michigan. The two mergers offer insights into the depth and breadth of Katerra's strategy.

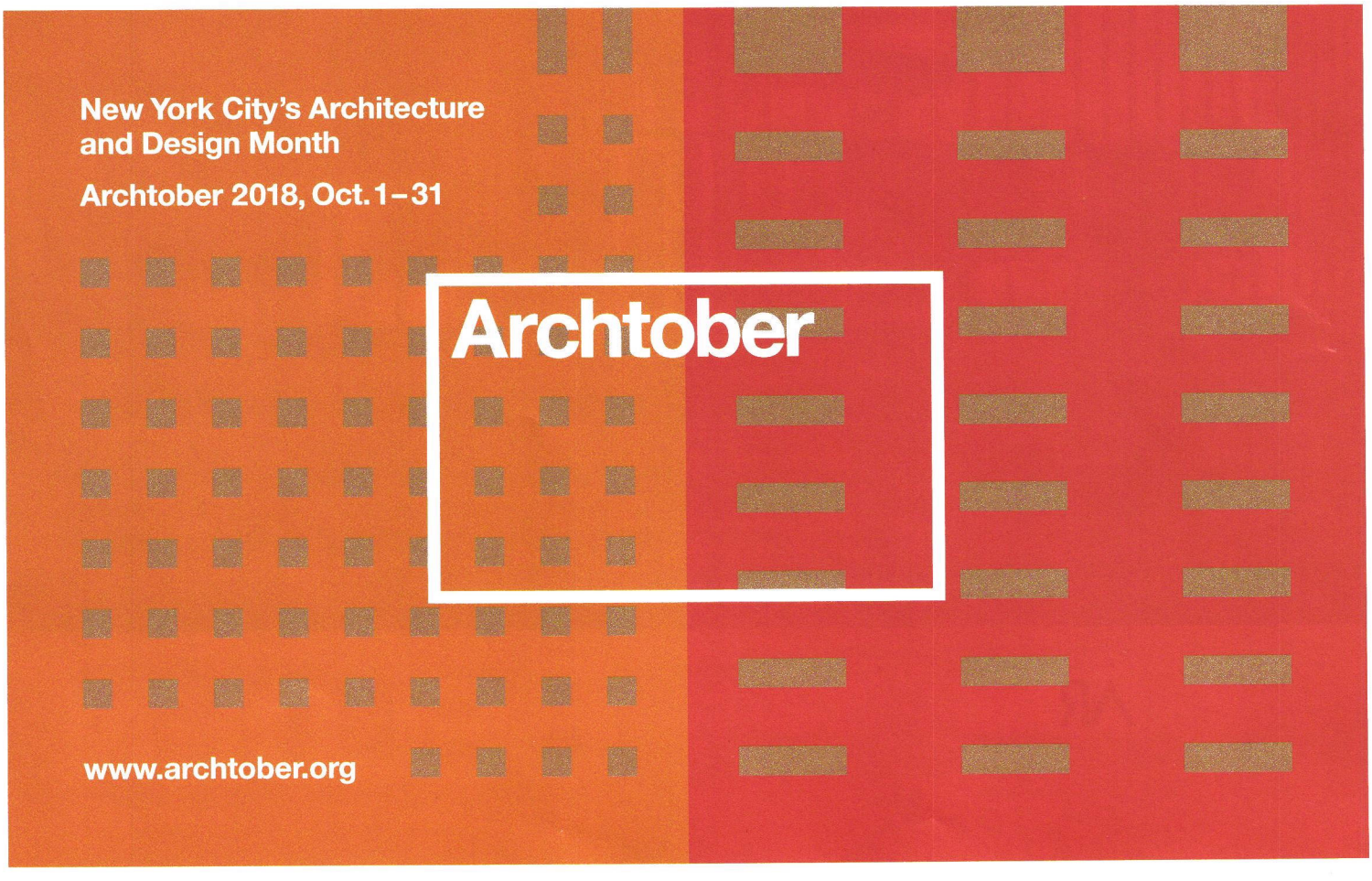
"Michael Green and his team have built a reputation for engaging design and leadership in the use of mass timber," said Michael Marks, chairman and cofounder of Katerra. "This goes a long way to support our mission to utilize cutting-edge technology and systems to revolutionize the construction industry."

Said Katerra design director Craig Curtis, FAIA, of Lord Aeck Sargent, "It has a body of work that goes back decades and a deep bench of talent. And being able to deliver from the eastern time zone will be huge."

Marks, the former head of Flex and interim CEO of Tesla, started Katerra in 2015 with Fritz Wolff, chairman of the real-estate development firm Wolff Company, and Jim Davidson, one of the founders of the venture firm Silver Lake. Headquartered in Menlo Park, California, the company has grown at an awe-inspiring pace courtesy of injections of capital, most notably $865 million in January from Japanese venture giant SoftBank. Since arriving in January 2016, Curtis, a 30-year veteran of Miller Hull, has built Katerra's Seattle office into a team of some 100 architects and industrial designers. Further elements include a 200,000-square-foot factory in Phoenix, supplying wall systems, trusses, cabinetry, and fixtures. Katerra also operates a lighting factory in Shenzhen, China, and design and software-development offices in Pune and Bangor, India. In the last year, it bought two regional multi-family giants: Dallas-based



Slated to open in 2020, the 150,000-square-foot Catalyst lab/office building planned for Spokane will use cross-laminated timber from Katerra's new factory.



residential remodeler United Renovations and northeast builder Fields Construction. Early next year, it will complete a 200,000 square foot CLT factory in Spokane. They have 19 projects under construction and dozens more in design, with reported billings of $1.3 billion. Still more acquisitions are planned. "We're just Silicon Valley tech guys attacking an industry that hasn't had any technology applied to it," Marks said.

Katerra has focused on market-rate multifamily housing, student and senior living, and master-planned apartment developments for Wolff, supplying everything from integrated wall systems to cabinetry and fixtures. But Marks and Curtis take pains to distinguish Katerra as a "design first" design-build company. "We are automating as much of the architectural process as we can," Marks stressed, "so the architects can do what they do best rather than worrying about the HVAC." The company is at work on licensable proprietary software that Curtis says will be a "game-changer" for construction-pricing transparency by directly integrating design tools with Katerra's supply and delivery line. The company is developing an energy system to modulate between the grid and photovoltaics to reduce energy costs.

"We as a team are thinking about designing space, but in the background we're also asking, 'Is this a wall panel I can repeat and use? How will it be made and how will it be trucked across the country? How does it connect to the floor plane?' It's as much about tectonics as architecture has ever been."

The new tools and Katerra's disruptive idealism drew Green into the partnership. An early proponent of mass timber, he is best known for two of North America's largest CLT structures: the Wood Innovation and Design Centre in Prince George, BC, and T3, a 220,000-square-foot, seven-story office building in Minneapolis. He was the first member of a "design consortium" Curtis created to, as he put it, "keep us honest." (Ted Flato of Lake|Flato and Andrea Leers of Leers Weinzapfel Associates have since joined as advisors.) The relationship with Green evolved into the design of Catalyst, a net zero–aspiring office/lab building, planned to open in Spokane in 2020, that will be the first to use CLT from Katerra's new factory.

"It couldn't be a better scenario," says Green of the merger. "We get all of Katerra's cool innovation capacity and R&D." Architects, he added, "have done a great disservice by concentrating on those who can afford architecture rather than on making architecture affordable to more people. That is what is driving us toward the Katerra model."

Ted Flato is equally "bullish on Katerra" but has also experienced the current limits of the company's idealism. Long an experimenter in modular housing, Flato was adapting his prototype "Porch House" concept to Katerra's production system last year—just as Hurricane Harvey walloped Texas, followed quickly by the Northern California fires. "I thought the catastrophes were real opportunities to provide more resilient housing fast," Flato said. But with only one factory and dozens of apartment buildings already booked, Katerra has slowed its single-family efforts.

"They are business people, so they are focusing on apartments," Flato said. "But their every effort seems to be to signal that design matters."

Michael Green Architecture and Lord Aeck Sargent will retain their names and locations, but now as subsidiaries of Katerra. None of the parties disclosed the acquisitions' terms. ■

Randy Gragg is a Portland, Oregon–based journalist and curator.

RENDERING: COURTESY KATERRA

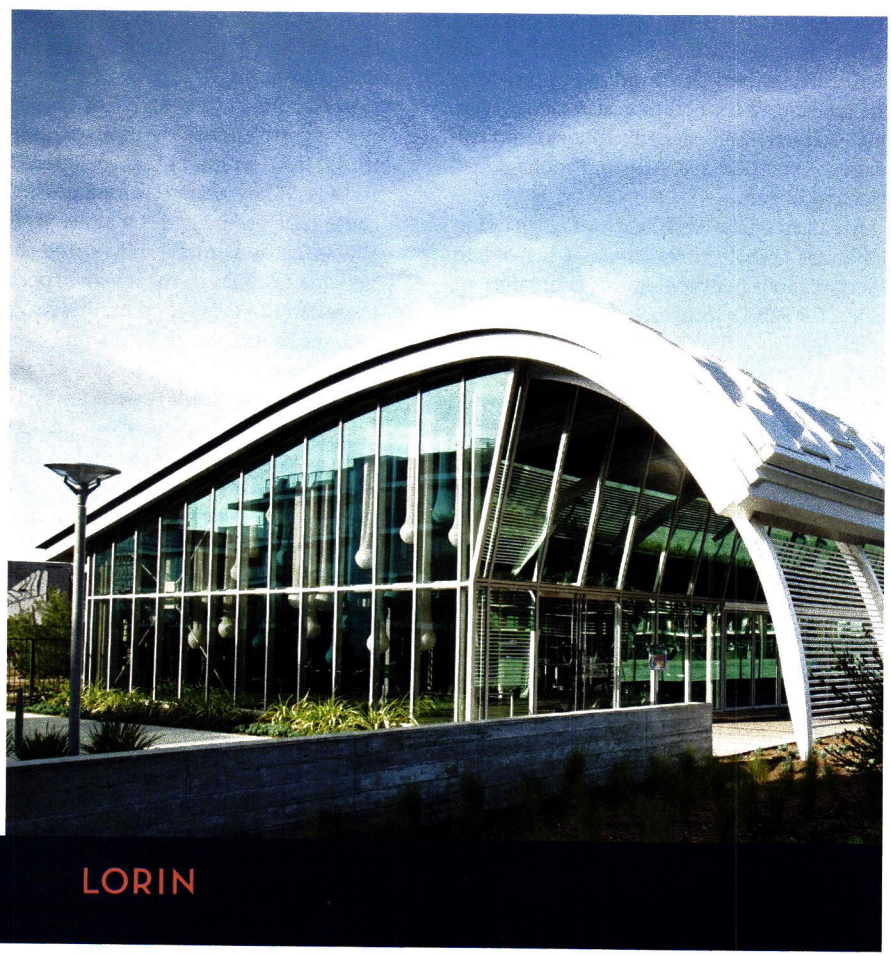
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Elsie Owusu

BY KELLY BEAMON

ARCHITECT ELSIE OWUSU is campaigning to become the first nonwhite president in the 185-year history of the Royal Institute of British Architects (RIBA). From July 3 to August 7, RIBA's 44,000 members will vote for a new leader, picking between Owusu, establishment favorite Alan Jones, and U.S.-based British architect Philip David Allsop. But Owusu's path to the nomination is the most fraught. An elected RIBA Council member since 2014 and vice chair of the London School of Architecture, Owusu has been praised for leading renovations on the UK Supreme Court building and Green Park Station transit hub. She has also been snubbed by some for accusing RIBA of institutionalized racism and sexism. But despite what she says have been dismissive comments from peers, "death threats" from a fellow Council member, and a failed 2015 bid for RIBA's vice presidency, Owusu launched a Twitter-based campaign in 2017 to increase RIBA's diversity called "+25." Her efforts raised the number of nonwhites on the governing council to a historic 12 from one—herself—and earned support from colleagues David Adjaye, Allison Brooks, and Richard Rogers.



An alum of the Architectural Association School of Architecture, Owusu, 64, spoke to RECORD about her contentious campaign, her vision for RIBA's future, and her own nimble practice.

You're not the first RIBA candidate to champion diversity. If you win, in what new ways will you boost inclusion?

We would embrace the digital future and model ways to truly work globally. For example, I have a virtual practice. Everyone works remotely across countries. When you work online it is easier to focus on the job at hand, and you don't worry about gender, class, and race. You leapfrog all of that. You could design something in London, send drawings to Lagos by WhatsApp, and, one day, view the construction site using a drone. Gone are the days of site inspections and muddy boots. You focus on talent and skill. It is a new mindset.

Why did you join RIBA initially?

When I started my own practice, clients would say, "We want to give you work, but you haven't got 'RIBA' after your name." There's a perception that you're not a proper architect without it. It's a very strong brand. When I joined in 2014, Jane Duncan, the president at the time, asked me to be a "Role Model," one of 12 architects asked to share their personal stories on the organization's website as a way to promote the idea that RIBA and the profession are open to people like them. Initially, I said no. I didn't want to represent an organization where I didn't feel fully engaged. But she convinced me it was important.

How did you make the journey from Role Model to public critic?

I woke up. In 2015, the Architects Registration Board, which regulates the profession, surveyed the industry and reported that the number of black and minority-ethnic architects in the UK was shrinking. Things had gotten worse. Around the same time, I had witnessed fellow Council members making sexist jokes about Jane during meetings.

That prompted you to speak up about behavior inside RIBA?

Yes. You think that these organizations have got the message after the groundswell movements of the 1950s onward. Then you realize the gains you thought you'd made have been set back.

But RIBA has had three women presidents. How can the culture still feel exclusive?

I've gotten abusive e-mails asking that same thing, from women I had considered my friends. "They've had women presidents. How could it be prejudiced?" It's like saying Theresa May is Prime Minister, how could there still be sexism? The fact is, there's an aspect of self-protection in this reaction, meaning women who make it through filters and gatekeepers don't always turn back to help other groups. Sometimes they pull the ladder up behind them, because they don't want to expose themselves to ridicule or danger from the majority.

You founded an organization in Ghana that teaches architecture to young children. Can such initiatives also create goodwill between UK firms and architects who feel rejected by the system?

If we can get them to stop listening to everything around them telling them that they don't matter. Young people from racially and ethnically diverse backgrounds don't have access to powerful networks in the UK, but they do have connections back home. We need people in charge to recognize that as an opportunity. They have the capacity to transform their own countries and create wonderful projects for the UK. ■

Diller Scofidio + Renfro and Woods Bagot Win Competition to Design Adelaide Contemporary

After an international search lasting seven months, the New York–based firm and the Australian practice received the commission to create a museum and sculpture park on the North Terrace of South Australia's capital city.

International Interior Design Association Installs Perkins+Will Principal as New Board President

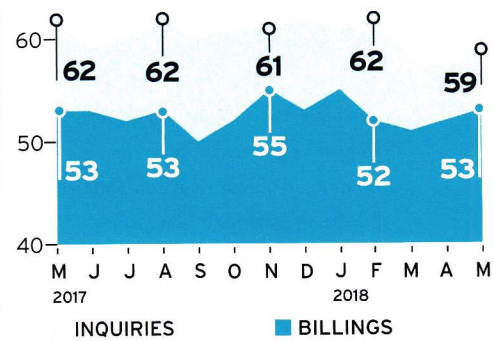
Perkins+Will's Global Diversity Director Gabrielle Bullock is the first African-American woman to oversee the international industry group for interior designers. Prior to her current role, she was the first African-American and first woman to become a managing director with P+W.

American Prize for Architecture Goes to KPF President

The Chicago Athenaeum Museum of Architecture and Design and the European Centre for Architecture Art Design and Urban Studies honored James von Klemperer, president of Kohn Pedersen Fox Associates, as the 2018 laureate for his built work and contributions to the profession.

Council on Tall Buildings and Urban Habitat Announces 2018 Awards

The 16th edition of the CTBUH Tall Building Awards recognized WOHA's Oasia Hotel Downtown in Singapore as the best tall building worldwide, and SHoP Architects' American Copper in New York as the best in the Americas.



Architecture Firm Billings Increase for Eighth Consecutive Month

According to the latest AIA data, the Architectural Billings Index increased slightly from 52.0 in April to 52.8 in May. (Scores over 50 indicate an increase in billings.) The project inquiries and design-contract indices, which both eased in April, rebounded to 59.3 and 53.3, respectively.

PHOTOGRAPHY: COURTESY ELSIE OWUSU

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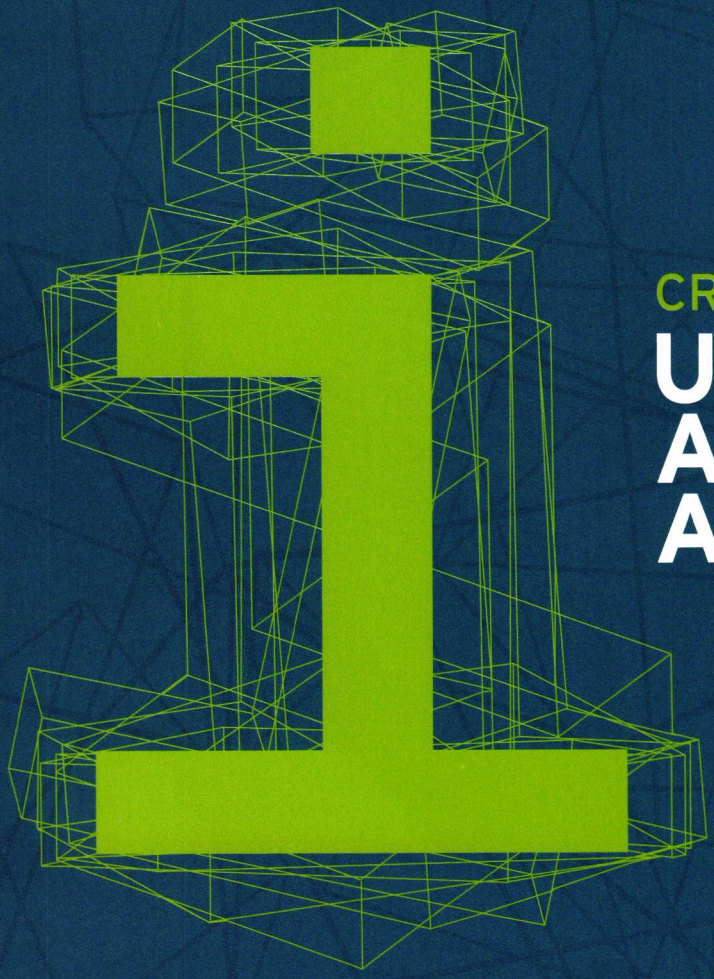
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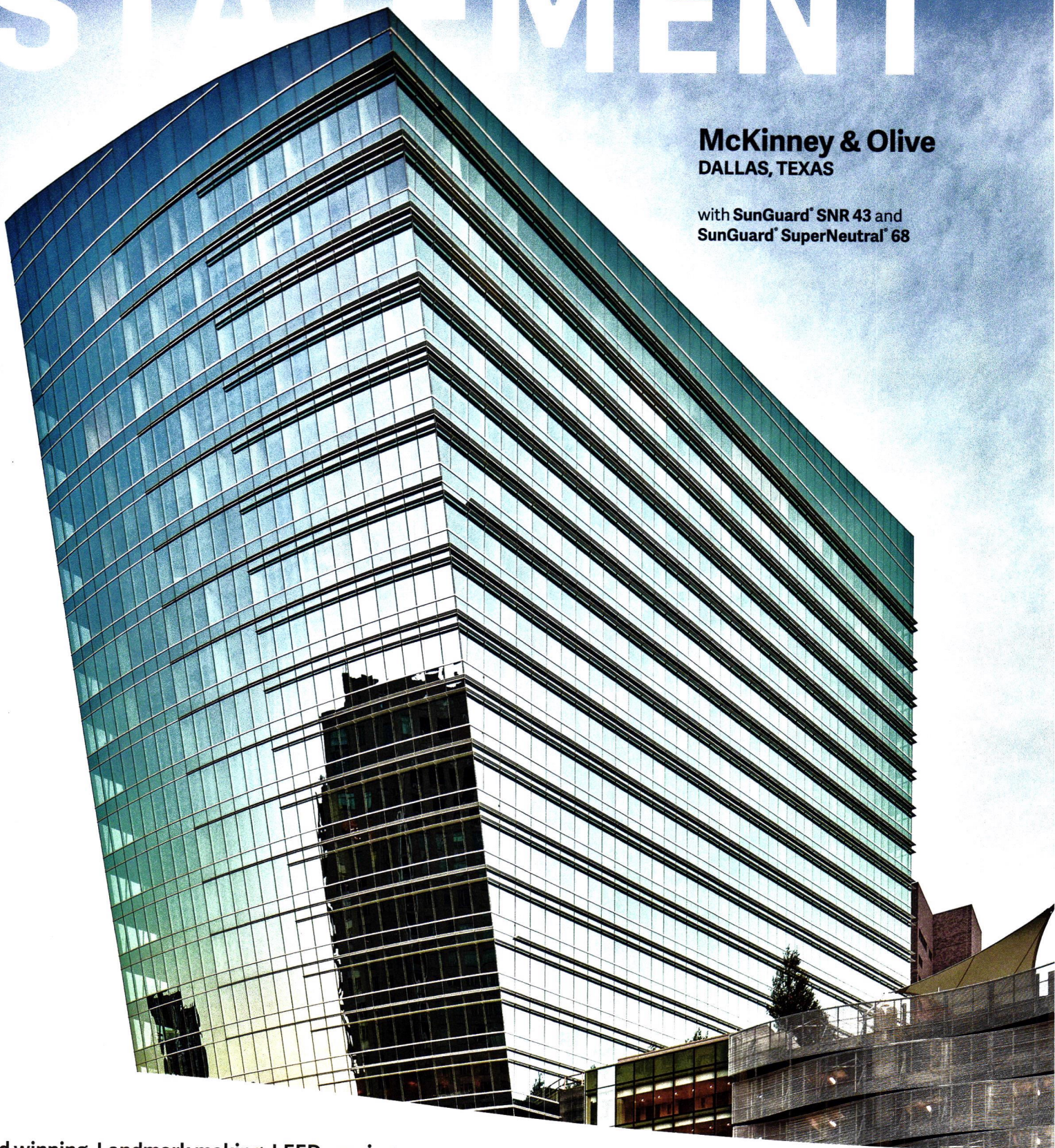
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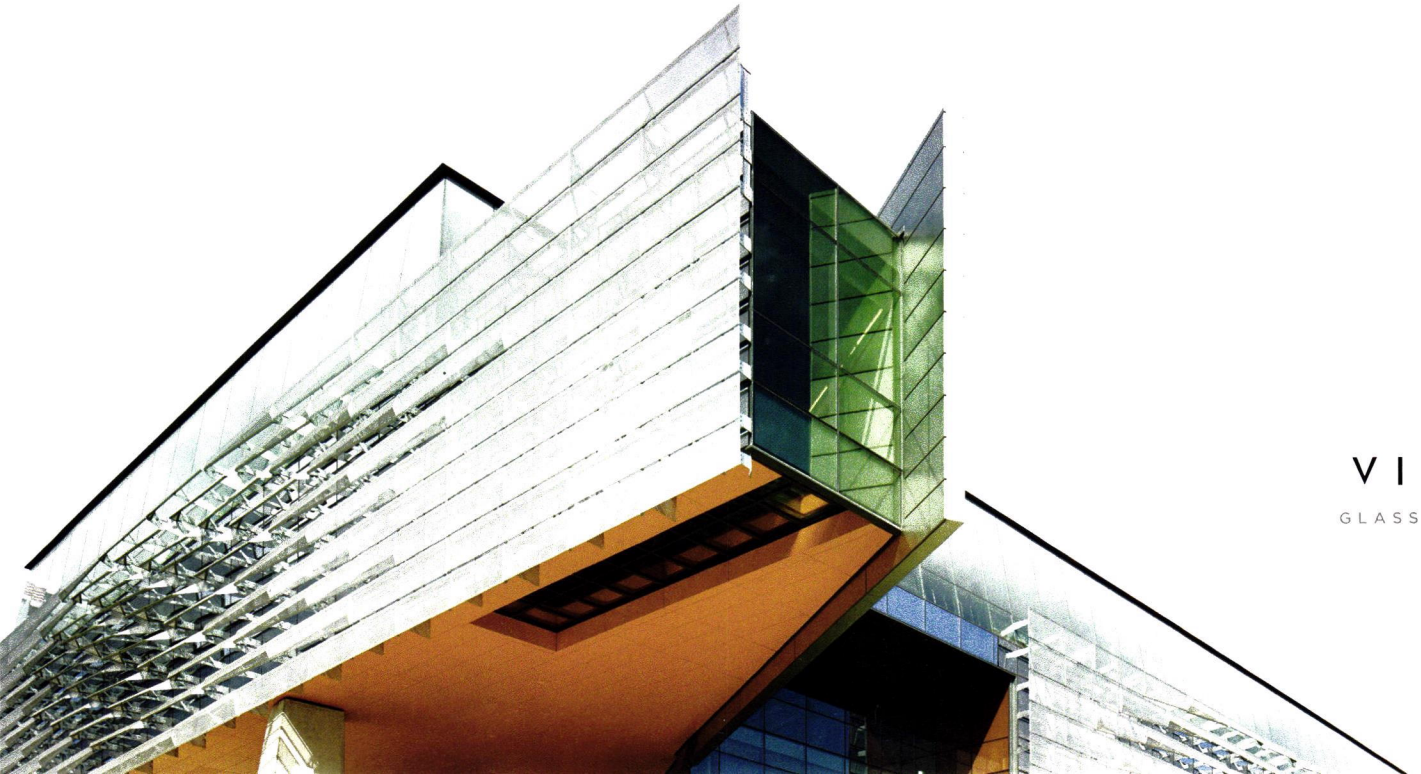
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IN NAPA COUNTY, A VACATION HOUSE'S ODD GEOMETRY CREATES AN INTRIGUING RELATIONSHIP BETWEEN INSIDE AND OUT. BY ALEX KLIMOSKI



AROUND EIGHT years ago, Ken Goto purchased an Edwardian house in San Francisco's North Beach neighborhood. The property included a separate structure behind the main residence, not visible from the street: a narrow, three-story stack of volumes with a facade of glass, steel, and ipe, snugly fit into the tight, rectangular backyard. Charmed by the hidden contemporary edifice, Goto found the architects—husband-and-wife team Lisa Iwamoto and Craig Scott—and asked them to design a small family vacation house on a craggy meadow in the hills of Napa County.

Goto, an engineer who has worked for Apple and Microsoft, envisioned a one-story structure that would sit lightly on the ground, unusual in appearance and in striking contrast to the rugged landscape. "I very much like structure and straight lines," says Goto, "so my original concept was more of a modern box."

After considering the vastness of the site, which faces mountains to the west and overlooks a lake to the east, the architects came up with a form that departed from their client's initial suggestion but would afford sweeping panoramic views. Again playing with geometries and negative space, they came up with a hexagonal plan, the interior punctured by a central rhombus-shaped courtyard. Iwamoto and Scott configured four rectilinear spaces—a living/kitchen/dining area, a master bedroom, a children's



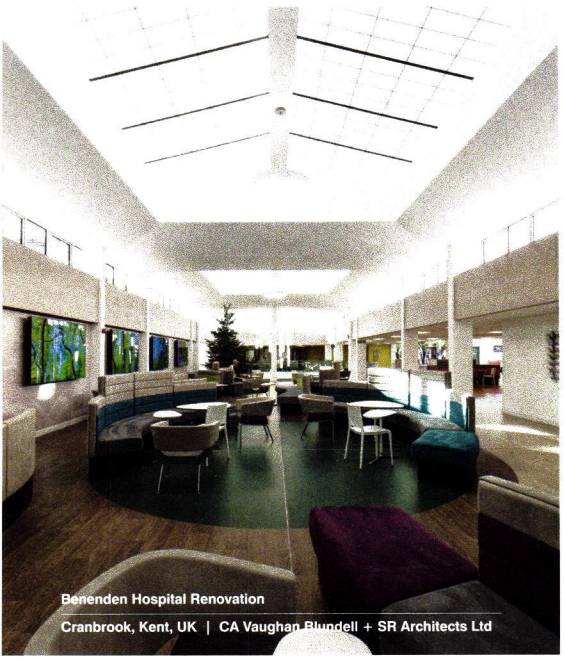


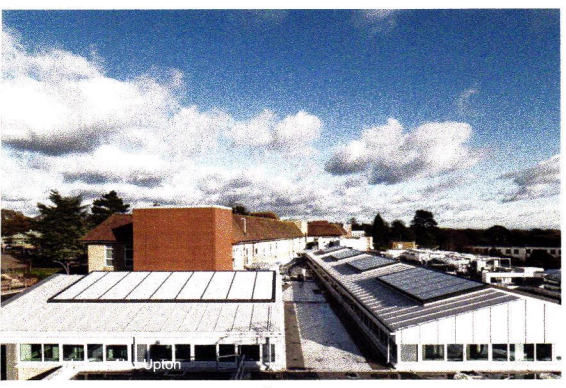
IwamotoScott Architecture clad the house in heavy-gauge steel panels to avoid buckling from rapid shifts in temperature (top). Each deck is surfaced in white oak slats and provides access to the outdoors (above). The house's unusual form is accentuated by ample glazing, which creates a dynamic visual connection to the surrounding landscape and interior courtyard garden (left).

PHOTOGRAPHY: © BRUCE DAMONTE

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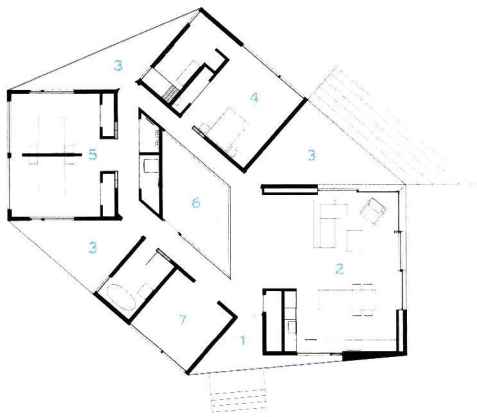
Four program spaces and four decks are organized around a small central courtyard in a hexagonal formation. The six-faced structure provides panoramic views of the Napa County hills and a nearby lake. Off the grid, the house's electricity, water, and other systems are controlled from a separate garage structure, just to the south.

room, and a yoga studio—around the core's angled edges, connecting the spaces between them with four shaded trapezoidal decks to complete the hexagon.

Inside the house, an interplay of acute and obtuse angles, as well as generous glazing on both interior and exterior walls, contribute to a dynamic visual experience. "There's this flickering back and forth between the inward focus of the central void and the outward pull of the surrounding landscape," says Scott, "which is then enriched by the reflections that change throughout the day."

Because the house is so spatially rich, the architects chose a subdued material palette. The coolness of the structure's outer steel skin and interior concrete floors is juxtaposed with the decks' white oak surfaces and, inside, walls of white birch. To amplify the house's unusual form, LED ambient and downlights produce the effect of a glowing interior at night. All four zones open out to the surroundings with sliding doors, naturally ventilating the house.

For Goto, the off-the-grid house has become a personal project; he mounted a photovoltaic system on the garage, located just south of the residence, and installed a battery pack for on-demand hot water and in-floor radiant heating, making the building entirely self-sufficient. (He is even hoping to boost solar capacity to charge his Tesla vehicle.) Aesthetically, he finds the unexpected shape endearing. "It's not something I've ever seen in such a setting—it's like a spacecraft," he says. "It looks wrong and right at the same time." ■



FLOOR PLAN

0 12 FT.
4 M.

1 ENTRY
2 LIVING/KITCHEN/DINING
3 DECK
4 MASTER BEDROOM
5 BEDROOM
6 COURTYARD
7 YOGA STUDIO

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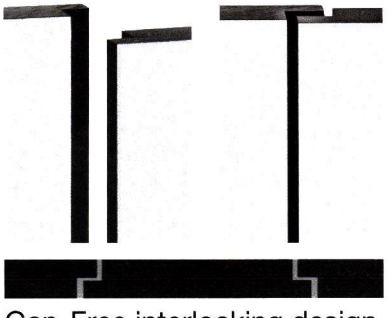
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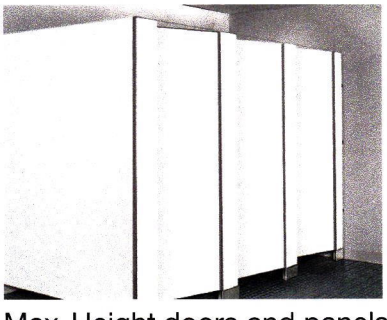


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BRANDON HAW ARCHITECTURE RECONSTRUCTS THE PATIENT EXPERIENCE FOR THE NEW YORK DERMATOLOGY GROUP. BY LINDA C. LENTZ



PHOTOGRAPHY: © ALBERT VECERKA/ESTO

BEAUTY MAY be skin deep, but New York Dermatology Group (NYDG) Integral Health & Wellness goes beyond the surface, treating its patients with a range of holistic services and remedies. This approach extends to its serene newly renovated facility on Fifth Avenue, designed by architect Brandon Haw's eponymous firm (BHA).

When Haw first visited the raw 7,000-square-foot space on the second floor of a landmarked 1906 John H. Duncan building in the Flatiron District of Manhattan, he was enthusiastic about its corner location, 10 large windows, and 16-foot-high ceilings. He quickly realized, however, that its loftlike expanse would be compromised by the client's programmatic requirements: a dozen treatment, therapy, and bodywork rooms, and space for a nutritionist, reception, administrative work, a waiting room, and retail.

To avoid the dark and cluttered hallmarks of a typical medical office, Haw created a lozenge-shaped pod—developed with Italian fabricators Paolo Cassina Custom Interiors, a furniture maker, and Sailing, known for its precise yacht interiors—for the core of the space. This element houses most of NYDG's clinical components, freeing up the daylight-filled perimeter for circulation, waiting patients, doctor's stations, and the sale of skin-care products.

Prefabricated in Italy with yacht-like precision, the central pod is made of interlocking 8.5"-wide by 12'-high MDF-backed fiberglass planks with an opalescent finish. The hospitality-style reception counter carved out of the pod's north side greets visitors as they exit the elevator and directs them toward the window-lined waiting area.



FLOOR PLAN

0 16 FT.
5 M.

1 RECEPTION
2 WAITING AREA
3 RETAIL
4 TREATMENT ROOM
5 ADMINISTRATION
6 VIP ELEVATOR
7 STORAGE
8 RESTROOM
9 PANTRY
10 STAIR
11 MECHANICALS

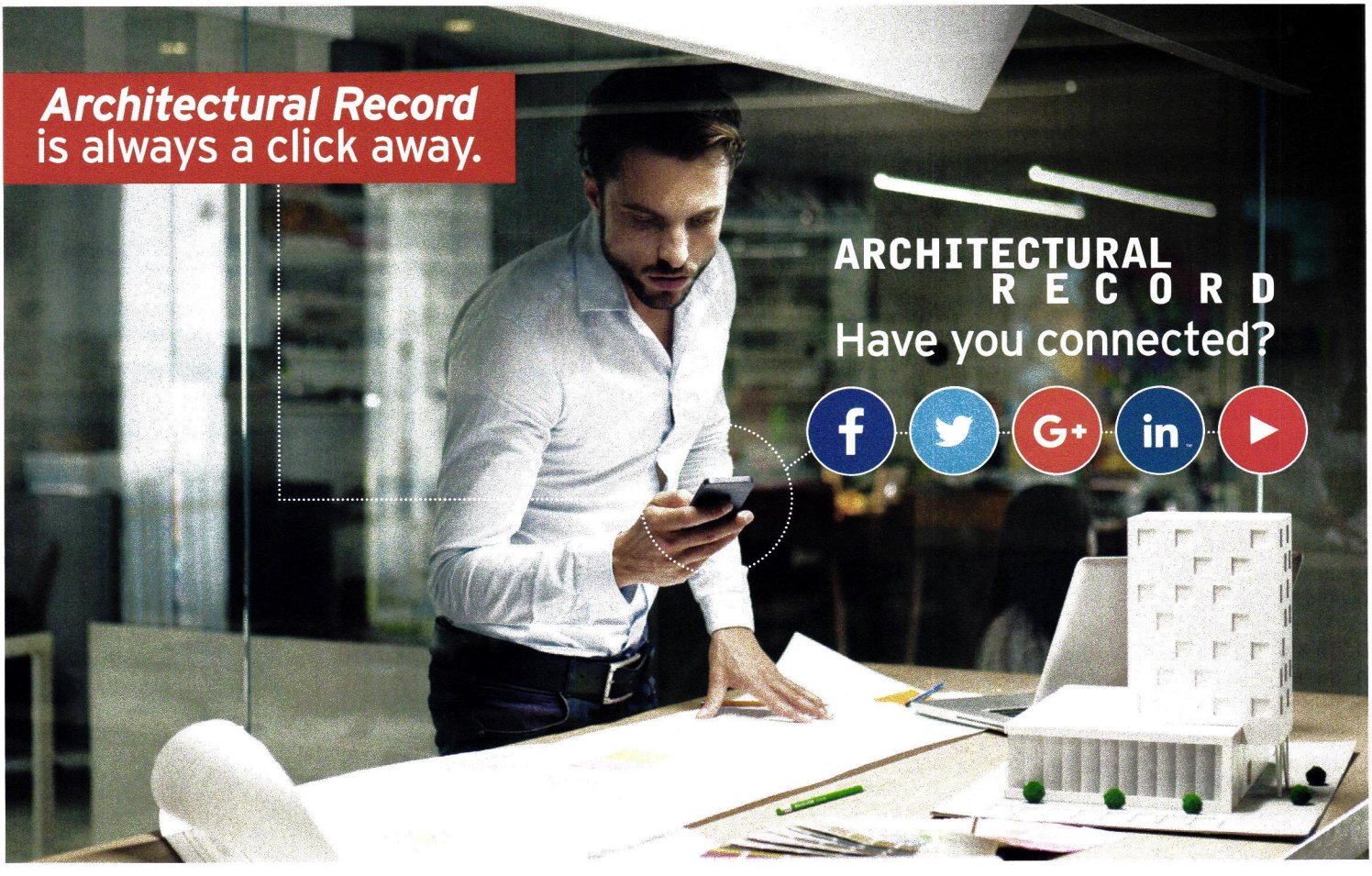




Designed by Haw, the waiting room furniture (above) was made by Paolo Cassina Custom Interiors. Warm LED downlights poke out between the ceiling's walnut slats, illuminating the pod. Within it, treatment rooms (top, right) feature poured-quartz flooring and stretch-textile ceiling inserts that softly diffuse overhead lighting.

Inspired by flowing curtains, the pod is clad with rippled, interlocking MDF-backed fiberglass planks in a creamy, opalescent finish that appears as though glowing from within. For contrast, BHA and the fabrication team used bronze as trim along the edges of the freestanding structure, as well as for the hardware, carrying the metal's rich hue to the recycled-oak floor, existing radiators, and walnut ceiling slats.

NYDG's aura is more spa than health-care facility, with gracious waiting room furniture designed by the architect and a warm illumination scheme throughout by Fisher Marantz Stone that blends imperceptibly with the sunlight that filters into the space from the south- and west-facing windows. "It is glorious," says Haw. ■




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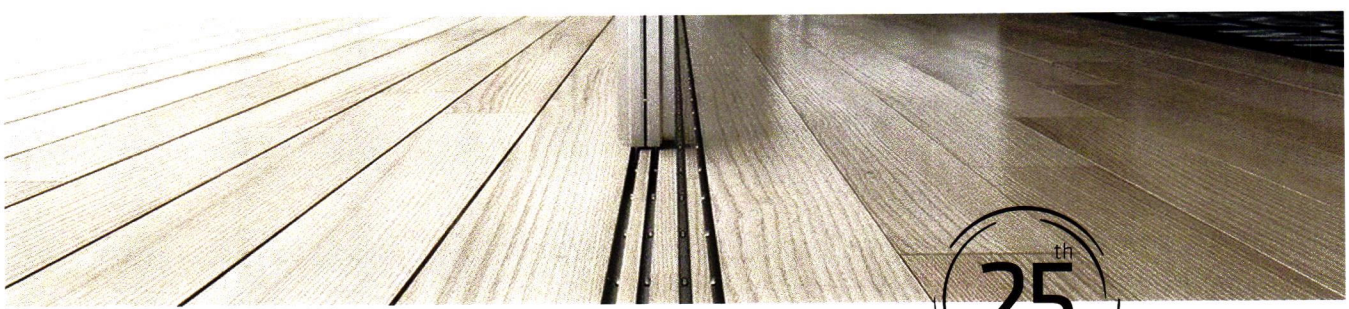
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The Venice Architecture Biennale 2018

A kinder, gentler event celebrates the local while overlooking globalization.

BY JOSEPH GIOVANNINI

FOR ALL the dreamy beauty of Venice and the grace of the stately Giardini, with its centenarian laurel and plane trees, the Architecture Biennale is often the scene of fierce, if polite, architectural battles, including career assassinations, hostile intellectual take-overs, and ritual Oedipal stabbings. Since its founding in 1980, curators take positions, their agendas displacing the status quo.

In this year's Biennale, "Freespace," the curators, Yvonne Farrell and Shelley McNamara, founders of the Dublin firm Grafton Architects, pursued "the generosity of spirit and sense of humanity at the core of architecture's agenda." But under the kinder, gentler, humanist umbrella of this seemingly benign mission statement, they basically staged an architectural Brexit, a Biennale that rejected the globalization practiced today by computer-driven starchitects in favor of localization practiced by architects with smaller operations rooted in communities, not served by jets.

Their manifesto critiqued the rampant architectural commercialism that impoverishes our environment—no argument there—but the unstated, confrontational subtext was to claim leadership for the more humble, underacknowledged architects who design buildings you simply want to touch: eye over mind, matter over concept. Interdisciplinarity, theory, and the computer itself were out as the curators focused on architecture's own language, on the thing itself: light, space, matter, and consequent feeling.

The heroes who survive Farrell and McNamara's decapitation are, for the most part, not marquee names but architects who have toiled nobly in the trenches doing thoughtful, community-oriented projects largely built by local craftsmen using local materials. Many hailed from developing countries; roughly half were women. In a reversal of the Biennale's historic pattern of international capitals' dominating provincial cities, Dublin trumped London. The Irish curators were translating into the show the "generosity" that they said is the basis of all good architecture by singing about the unsung.

In their curatorial precincts in the Biennale—the ancient Arsenale and the modern Central Pavilion in the Giardini—Farrell and McNamara explain their apparently polite but fundamentally radical coup d'état, project by project, in labels written in accessible language tailored to accessible buildings. London architect Alison Brooks believes "beauty is a language that has been lost." Norwegian architects Jensen & Skodvin show "a deep respect for the environment," and Irish architects de Blacam and Meagher believe "that architecture is for human beings." The curators cite Laurent Beaudouin, who describes architecture "as a machine for slowing time down."

To the extent that there are well-established figures, Farrell and McNamara selected formally quiet architects, like Mario Botta, chosen for his respect for "place, context, culture," and Alvaro Siza, for his "personal poetic response."

If you squint mentally at the text labels, despite the cloying, touchy-feely



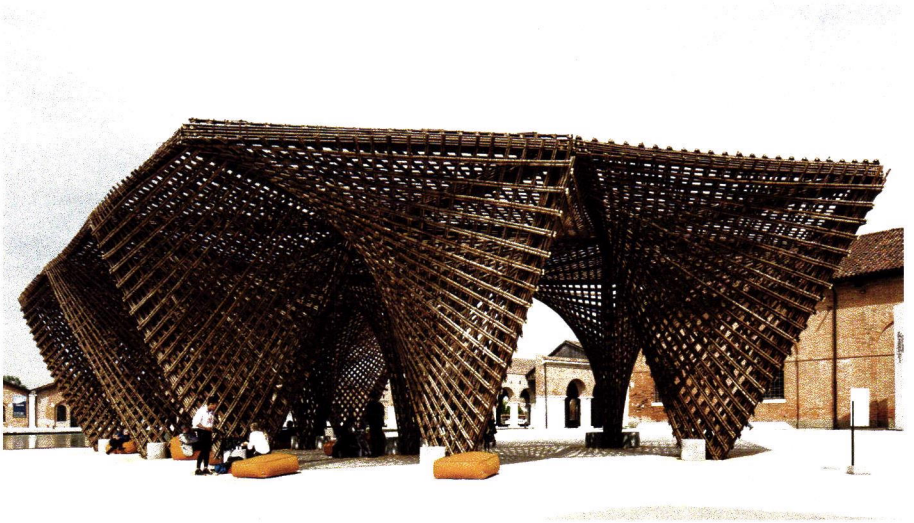


Norman Foster's *Crosses Morphed into a Tensegrity Structure* (top) is part of the Vatican's first participation in the architectural biennale. Mario Botta's *The Practice of Teaching* installation (above) is a standout in the Arsenale.

PHOTOGRAPHY: © ROLAND HALBE (TOP); ANDREA AVEZZÙ, COURTESY LA BIENNALE DI VENEZIA (BOTTOM)

platitudes, you understand that the architects are constructing an architectural vision around basics, and you appreciate there's a certain bravery in earnestly promoting architectural "virtue" in fast-paced times focused on profits rather than sincerity.

The problem with the fundamentalism is that the curators were preaching to the converted: their values were self-evident. The error is one of omission. The show overlooks the extraordinary capacity of the computer to free space, and, in its emphasis on the village as a metaphor, it overlooks the fact that one of the most urgent issues confronting the field today is mass global urbanization. By 2050, 66 percent of humanity will be living in cities. Strangely, there were only two high-rise projects in the Arsenale's vast exhibition area, one by Barcelona's Carme Pinós and the other by New York's Diller Scofidio + Renfro, which both showed that large-scale buildings could incorporate "Freespace" values. In one of the only computer-generated projects, Vietnamese architect Vo Trong Nghia (VTN) used bamboo to structure an ambitious outdoor waterside shade pavilion, *Bamboo Stalactite*, in an exemplary fusion of digital technology and a common material that otherwise somehow eluded the show.



Vietnamese architect Vo Trong Nghia created the temporary pavilion *Bamboo Stalactite*.

There were, of course, many projects to admire, especially because—per the manifesto—most architects did not parachute into a commission with a culturally insensitive, precooked approach. Tiantian Xu, a Chinese architect and Harvard grad who heads a six-person Beijing firm, DnA Design and Architecture, showed models and images of a series of small public buildings—a teahouse, theater, pedestrian bridge, museum—beautifully crafted in stone, bamboo, and wood in Chinese villages; her designs clearly grew from within the culture. British architects Peter Salter and Fenella Collingridges highlighted the issue of craft, proposing a clever, beautifully built contraption of movable seats and screens that introduced the idea of participatory architecture.

There were many engaging, touching, mostly small-scale projects exhibited in skillfully executed, often delightful installations in the Arsenale, but the Biennale lost traction in the adjacent Central Pavilion, where too many exhibits took a fallback position in intellectually safe historical territory. In a rebuttal to the computer, a large hall displayed magisterial drawings of the past, done by architects who drew like angels. The Chinese architect and Pritzker laureate Wang Shu piously noted, "Pencils, not computers, are guardians of place and atmosphere." Other rooms exhibited four projects for Venice by the Modernist masters Le Corbusier, Louis Kahn, Frank Lloyd Wright, and Isamu Noguchi that were never built. In the central entry hall of the pavilion, a score of Irish architects interpreted in their own installations buildings that have inspired them—the Beinecke Rare Book & Manuscript Library at Yale or a theater by Auguste Perret, for example.

But the most deflating room was the prominent exhibition of Peter Zumthor. The Swiss architect displayed a towering, thumb-printed clay model; another was made in beeswax; an imposing black model, built with what looked like rocks, represented a hillside spotted with small pavilions. Zumthor rejected any digital representations, including CNC milling and digital printing. Handmade, tactile, experiential, the models represented the haptic architecture that presumably results when the values expressed in the manifesto are embodied in a building. But what the tactility of the models couldn't hide was that Zumthor's designs showed only an exploration of surface, not space. The buildings themselves were either boxes or pancakes.

Instead of proving the manifesto, Zumthor's projects, occupying a commanding space as though it were an emblem of the show, cast doubt that its thesis, at least as interpreted by Zumthor, was sufficient to power a vision for a complete architecture.

The Biennale suddenly became less doctrinaire and more alive in the national pavilions on the grounds of the Giardini, outside the curatorial purview of Farrell and McNamara, where the theme "Freespace" was not interpreted so literally. The Egyptian pavilion exhibited the informal, spontaneous habitats of street vendors that in Cairo combust spontaneously within the armature of the structured city. In this ephemeral micro-economy, nothing is discarded but is reapplied and repurposed. The exuberant Spanish pavilion wallpapered all surfaces, including ceilings, with the graphic results of an open call on an open digital platform. The introductory statement of purpose captured a spirit that escaped the main show: "to expand the limits and conditions previously understood by our discipline . . . by means of a critical approach put into practice . . . in an open intellectual experience where students cook up their conflicts."

The Biennale in the Arsenale and Central Pavilion showed us what we already knew, while the less conservative Spanish pavilion searched for what we didn't.

Each year, many countries and entities exhibit off campus, and, in its first appearance in a Venice architecture biennale, the Vatican nearly stole the show, building chapels in the park behind Palladio's San Giorgio Maggiore, on the island opposite the Giardini. Here, in the context of a 16th-century Renaissance basilica that for centuries defined how congregations should worship, 10 firms built 10 different ecumenical ways to be Catholic: light as revelation, nature as revelation, monoliths, openness, enclosure. British starchitect Norman Foster built a particularly evocative open-air chapel structured in wood, with steel members that cross overhead to represent the crucifixion while supporting the meandering trellised structure. A liberal rather than conservative church was exploring new ground, finding new values on which to build a very old idea. ■

The Venice Biennale runs through November 25.

Joseph Giovannini is an architect and critic whose book Architecture Unbound: An Alternative History of Alternative Architecture *will be published next year.*

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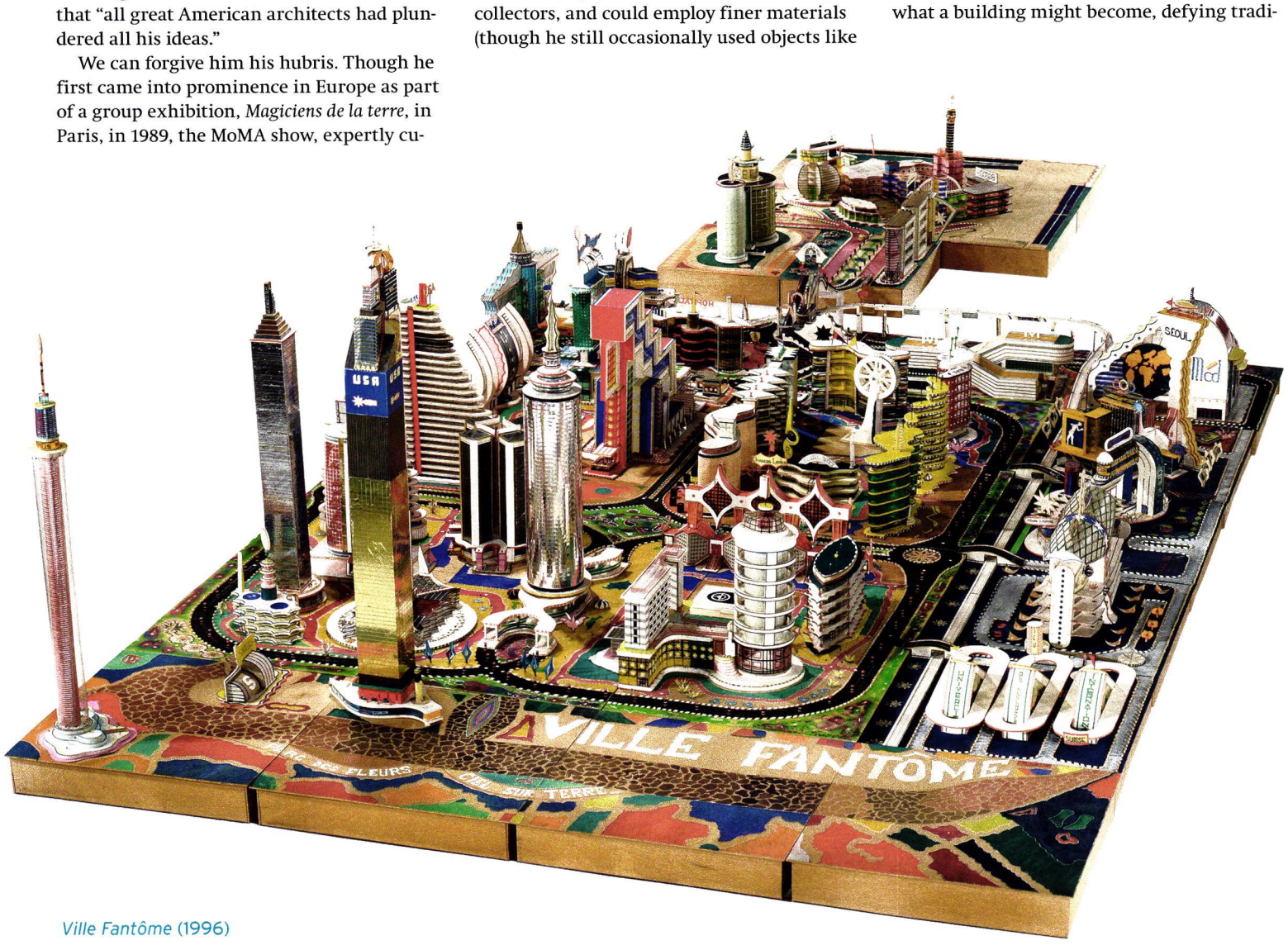
Dreaming of Fantastic Cities of the Future

A new show at the Museum of Modern Art in New York unveils the glorious work of an African artist who reimagined architecture and the urban realm.

BY TAU TAVENGWA

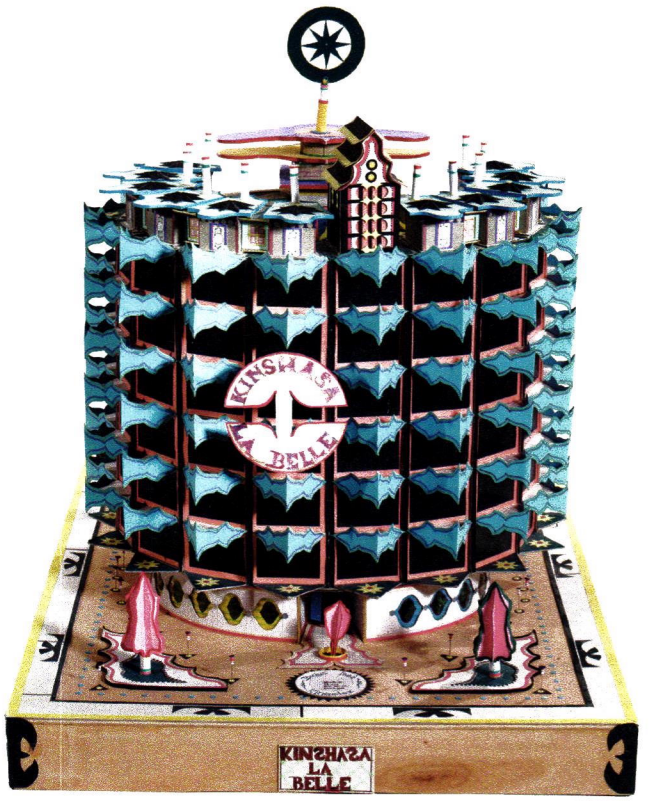
THE DEMOCRATIC REPUBLIC OF CONGO (DRC) has a long history of larger-than-life characters—politicians, musicians, and even the man or woman on the street—who display a grandiose sense of self that often confounds outsiders. Bodys Isek Kingelez (1948–2015), whose work is currently on view in all its astonishing glory at New York's Museum of Modern Art (MoMA), was such a Congolese archetype. Throughout his career, the artist promoted myths about his renown and abilities, declaring himself "a small god." In his visionary art, he created fantastical miniature buildings and cities—and once told a curator that "all great American architects had plundered all his ideas."

We can forgive him his hubris. Though he first came into prominence in Europe as part of a group exhibition, *Magiciens de la terre*, in Paris, in 1989, the MoMA show, expertly curated by Sarah Suzuki, is his first retrospective in the U.S., and it is a revelation. Titled *Bodys Izek Kingelez: City Dreams*, it features 33 small structures and models of cities that could be categorized as both sculpture and make-believe architectural maquettes. In his early work, Kingelez used found packaging, cardboard, and other materials that he glued together and assembled into playful but not yet elaborate miniature buildings. The later work, such as his intricately detailed masterpiece *Ville Fantôme* (1996), is testimony to his improved economic status as he became known, accepted commissions from European collectors, and could employ finer materials (though he still occasionally used objects like soda and beer cans in a work such as *Sports International*). Consistent through various periods of his career is the extraordinarily detailed ornamental painting, the vibrant colors, the lively calligraphy, and the ambition of each piece. Some of his work shows influences of Art Deco and the emerging post-colonial architecture that began to appear in Kinshasa and other parts of the DRC during the era of dictator Mobutu Sese Seko (1965–97), designed by architects like the Tunisian Olivier Clement Cacoub and the Congolese Fernando Tala-Ngai. Most of Kingelez's pieces, however, are the artist's own reimagining of what a building might become, defying tradi-



Ville Fantôme (1996)

PHOTOGRAPHY: © MAURICE AESCHIMANN, COURTESY CAAC-THE PIGOZZI COLLECTION (THIS PAGE AND OPPOSITE, TOP); VINCENT EVERARTS PHOTOGRAPHY, COURTESY VAN LIERDE



Kinshasa la Belle (1991)

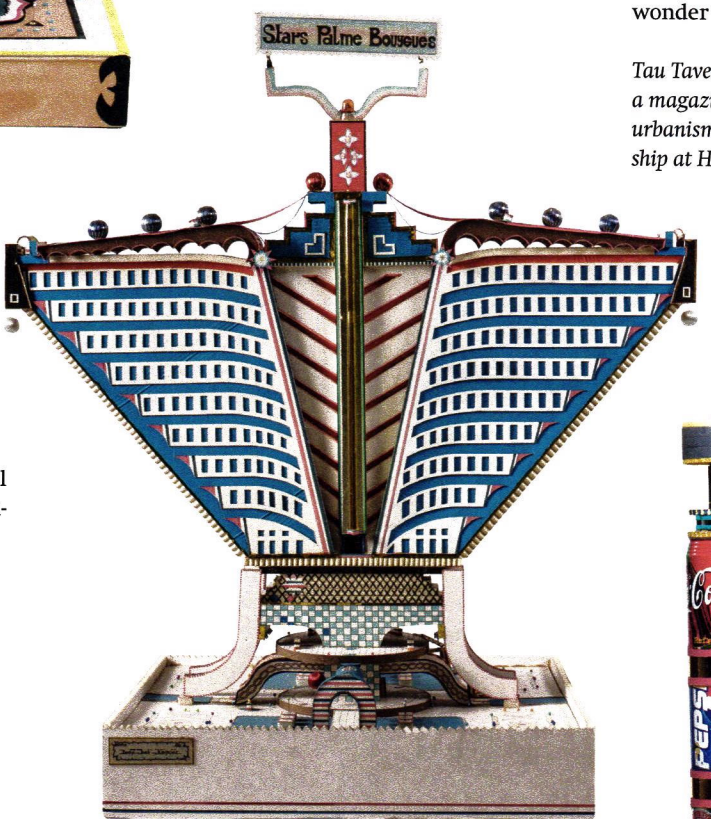
tional ideas of form and function in ways that would perplex any structural engineer.

Born in a small Congolese village, Kingelez moved to the capital, Leopoldville (now Kinshasa), in 1970 to study at the local university in subjects ranging from business to industrial design. In the mythology, after a stint teaching (and he was, by his own telling, "an excellent teacher"), he was struck by a feverish desire to work with his hands. His sculpture *Musée National* was so striking that a neighbor encouraged him to show it. At the national museum of the Congo, disbelieving staffers challenged him to make another piece as they watched, in order to authenticate his prowess. Inspired by Mobutu's promotion of the arts and the push to develop a modern Congolese style, Kingelez developed his unique work. His dreamy and vibrant worlds grew from an obsessive interest in cities at a time when urban centers in Africa had not begun to swell into the megalopolises they are today. Kinshasa's population has multiplied many times over, to 12 million people, since Kingelez first arrived there as a student.

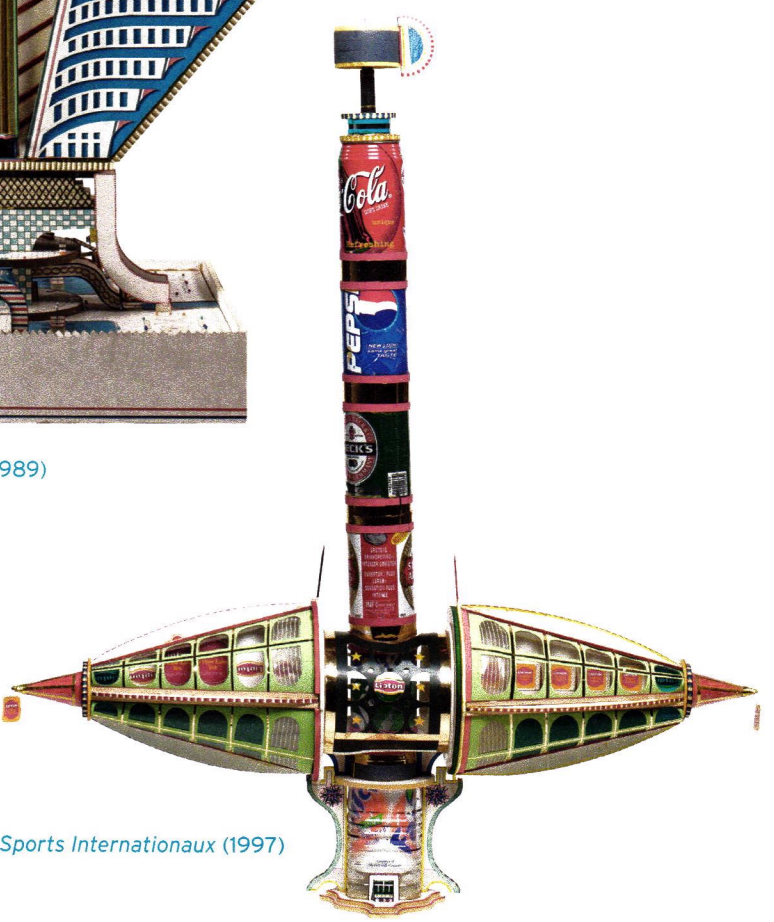
For *Ville Fantôme*, the centerpiece of the MoMA show, he created over 40 single buildings, each carefully detailed, along with roads, parks, and public spaces. The designs are a surprising mix of familiar architectural motifs with fantastical forms crafted from translucent sheeting, plastic, cardboard, and various paper stock, all meticulously painted. Kingelez knew he was creating a utopia: in his writings, he described *Fantôme* as having "no police force . . . to protect the city, there are no soldiers to defend it, no doctors to heal the sick. It's a peaceful city where everybody is free. It's a city that breathes nothing but joy, the beauty of life. It's a melting pot of all races in the world. Here you live in a paradise, just like heaven." His projects are a paradise of public buildings, convention centers, and sports arenas, but, in a fascinating omission, there are no cars or people—a reminder that, rather than look at Kingelez's work as real architectural propositions, they should be viewed as art. *Fantôme*, like his other sculptures, is conceived as a secular vision of an elusive and prosperous future from the mind of a self-assured nonconformist. "Kingelez is not an architect and does not wish to be considered one," a friend, quoted in the exhibition catalogue, once said. "He is surprised when you ask him if he wants to see his works actually built."

Still, his art dares anyone engaged in creating the built environment today—architects, artists, planners, builders—to dream bigger and bring a sense of wonder into imagining the future. ■

Tau Tavengwa is the founder of Cityscapes, *a magazine based in Cape Town focused on urbanism. He just completed a Loeb Fellowship at Harvard's GSD.*



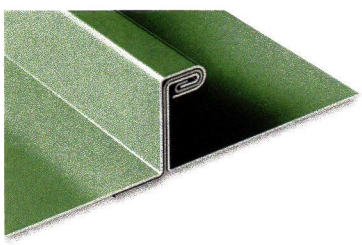
Stars Palme Bouygues (1989)



Sports Internationaux (1997)



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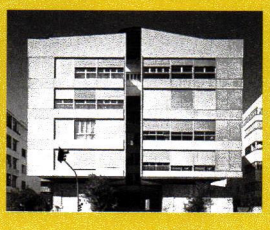
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The architect for the June issue's contest is **Luigi Moretti**. The Italian architect completed the apartment building in Rome, Il Girasole (left), in 1950. Renewed attention came to the residential work after Robert Venturi showed interest in the ambiguity of its split facade in his influential book *Complexity and Contradiction in Architecture*, 1966.

By entering, you have a chance to win an iPad mini.
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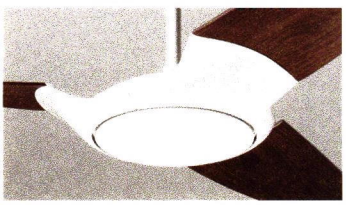
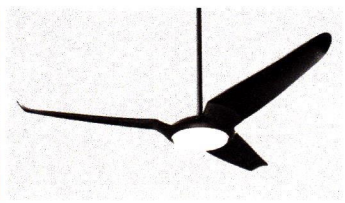
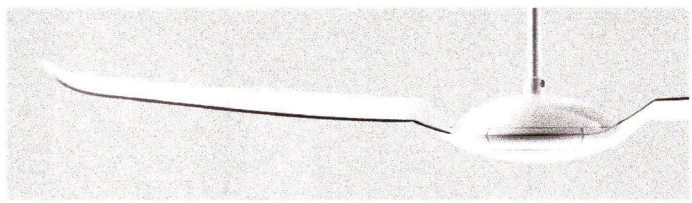
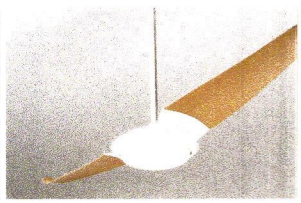
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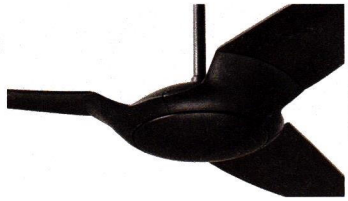
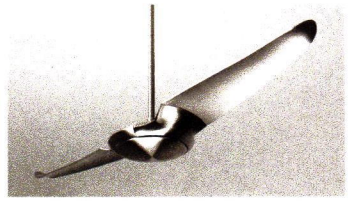


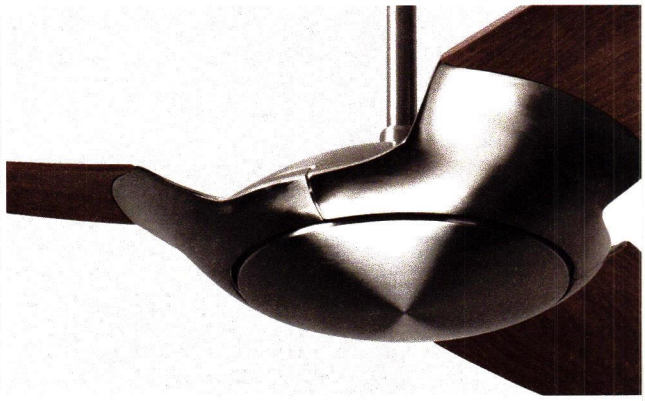
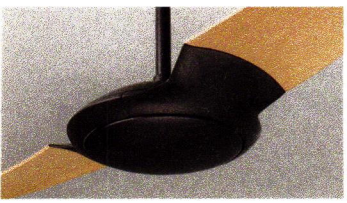
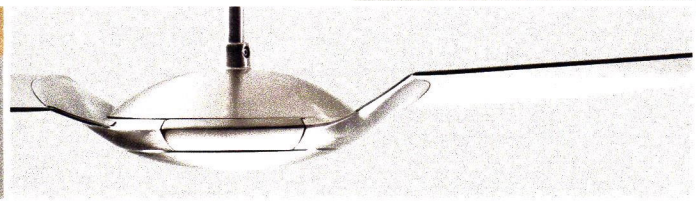
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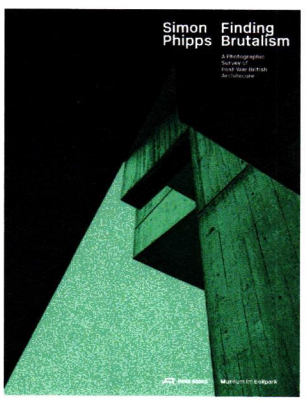
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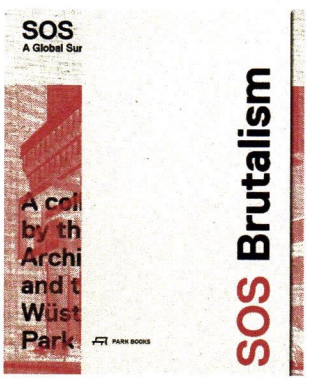
Coffee Table Concrete

Finding Brutalism: A Photographic Survey of Post-War British Architecture, *edited by Simon Phipps, Hilar Stadler, and Andreas Hertach. University of Chicago Press and Park Books, 256 pages, $39.*

SOS Brutalism: A Global Survey, *edited by Oliver Elser, Philip Kurz, and Peter Cachola Schmal. University of Chicago Press and Park Books (two volumes), 716 pages, $69.*

Reviewed by Deane Madsen





PERHAPS THE aesthetic equivalent of licorice, Brutalism is revered and reviled with equal vehemence. Proponents find appeal in its rough, usually concrete, textural finishes, while detractors have called for the removal of what they consider to be ugly, stained, bunkerlike structures. Brutalist buildings have found themselves in precarious preservation territory of late; many, some over 60 years old, have fallen into disrepair, yet are ineligible for landmark status, resulting in emotionally devastating demolitions such as Alison and Peter Smithson's Robin Hood Gardens' in London, built in 1972 and torn down in 2017. Supporters fear additional losses and want to document these buildings before they disappear—therefore spurring a spate of books and conferences.

Brutalism's substantive meaning has conflicting origin myths. In the UK, the Smithsons gave the term "New Brutalism" to a warehouse-vernacular aesthetic with an emphasis on as-found materiality, usually brick and concrete. In 1955, critic Reyner Banham cited the Smithsons' work as crucial to this movement; his 1966 book, *The New Brutalism: Ethic or Aesthetic?,* further disseminated the term. Le Corbusier's use of *béton brut*—exemplified by his Unité d'Habitation social housing projects of the 1950s, along with the architecture of Paul Rudolph and others in the United States in the 1960s—helped shift the defining characteristic of Brutalism from raw materiality to raw concrete, the literal translation of the French term.

SOS Brutalism presents the theoretical issues behind the term in a two-volume set covering the origins, current state, and potential future of Brutalism. The eponymous first volume is a worldwide compendium—based on the website #SOSBrutalism—that has more than 1,100 Brutalist buildings in its database. This effort is filled with case studies and examples of structures of varying status: still in use (such as Minoru Yamasaki's Shiraz University in Iran), heritage-protected, under threat of elimination, or demolished. Chapter introductions show the divergent attitudes to each region's embrace of the movement. The companion volume, *Brutalism: Contributions to the International Symposium* in Berlin 2012, comprises 17 lectures in which authors investigate theories and regions where Brutalism was practiced according to country-specific interpretations.

In *Finding Brutalism*, Simon Phipps lets a rich assortment of his black-and-white photographs do the talking, save for a trio of essays at the back. But that's precisely the point: each of his images is a 1,000-word composition on material, scale, or form, and Phipps is a master storyteller in this medium without "the distractions and extraneous detail of color," so, as he writes, "the form and structure and surface textures [can] be amplified by the action of light and shadow." His approach returns to the origins: "The biggest misunderstanding about Brutalism is that it is all about concrete—not only concrete, but massively formed concrete. The essence of Brutalism for me is material 'as found.'"

The *SOS* book calls for recognition and understanding of buildings that contribute to a global heritage, which is being lost as individual examples fall into disrepair and sometimes demise. *Finding Brutalism* echoes this call through its meticulous cataloguing of specimens that continue to erode. Both books serve as weighty reminders of our collective legacy, preserved in print if, in the event, they fail to survive as architecture. ■

Deane Madsen is an architecture writer based in Washington, D.C.



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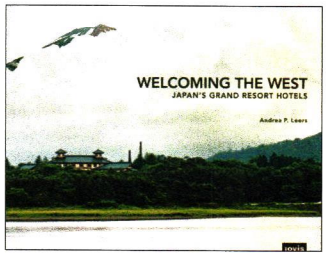
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Architecture of Tourism in the Far East

Welcoming the West: Japan's Grand Resort Hotels, *by Andrea P. Leers. Jovis Verlag, 144 pages, $40.*

Reviewed by Naomi R. Pollock, FAIA



WITH ITS ELEGANT oblong shape and captivating cover image, this historical survey would look great on any coffee table. But after you savor its photos and pore over its archival building plans, you should give architect Andrea Leers's cogent text a good read. This fascinating story of Japan's early resort hotels is an important addition to the study of the country's architecture and is the only book available in English, or in any other language, investigating these unprecedented works.

Contrasting starkly with Japan's traditional small-scale inns, these palatial edifices were built during the late 19th and early 20th centuries, when the country was eager to attract foreign visitors. As Leers relates, the first wave of Western buildings had arisen shortly after Japan opened its doors to the world at the start of the Meiji period (1868–1912), ending some 200 years of near isolation. In its quest to quickly modernize, Japan mimicked European and American antecedents when it began constructing public and commercial buildings. As the Japanese absorbed technology from abroad, copying gave way to blended architectural vocabularies. In the case of these hotels, this resulted in an intriguing new expression.

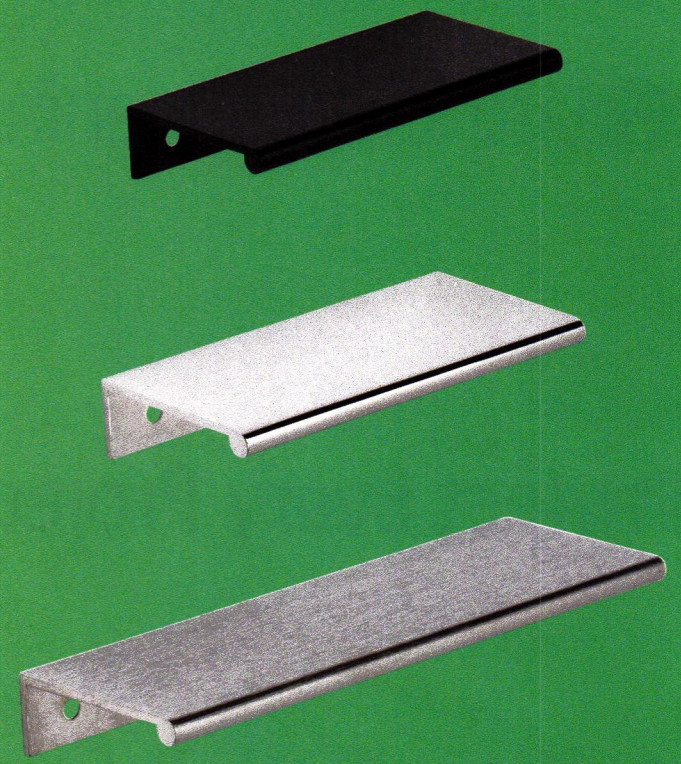
Apt reflections of the political and economic shift, these buildings incorporated eastern and western architecture, clearly expressing both construction cultures. Hotel builders and their architects imported Western functional elements, such as porte cochère entrances, spacious lobbies, and formal dining rooms, and adorned them with pagodas, tiled roofs, and woven bamboo ceilings. Termed "Japanese Picturesque" by the author, these curious hybrid buildings were exotic, yet familiar to overseas guests.

But because these early experiments were overshadowed by Japan's exquisite traditional timber buildings as well as innovative modern design, the resort architecture has been long overlooked by architects, as well as scholars who questioned its historic significance. Leers disagrees. "I discovered there was something in between [the contemporary and the traditional]," she says. Her interest was initially piqued by a chance visit to the Fuji View Hotel, where woodsy Adirondacks lodge meets rustic Japanese farmhouse. When she won a National Endowment for the Arts study grant in 1982, she was able to visit and research hotels at several locations around Japan, such as the Nara Hotel (1909) in the Kyoto-Nara area, the Nikko Kanaya Hotel north of Tokyo (1882–1904, 1935), and the Gamagori Hotel south of Nagoya (1934).

Appealing to both general readers and a professional audience, the book includes individual descriptions, general interest anecdotes, and historical references as well as an analysis of architectural planning and design elements. Since the visual images are culled from a variety of sources, the presentation is a bit uneven, but it is reminiscent of an old-fashioned travel log. Similarly, the book's rectangular shape evokes the lacquer-covered souvenir albums produced for Meiji-period tourists. Though most of the remarkable buildings included in this volume are still standing, many have undergone substantial renovations and additions. Due to stylistic trends, structural code upgrades, and the national appetite for the next new thing, vintage buildings throughout Japan are very vulnerable to demolition. By documenting these resort hotels and highlighting the importance of their unique architecture, *Welcoming the West* may encourage their preservation. Let's hope so. ■

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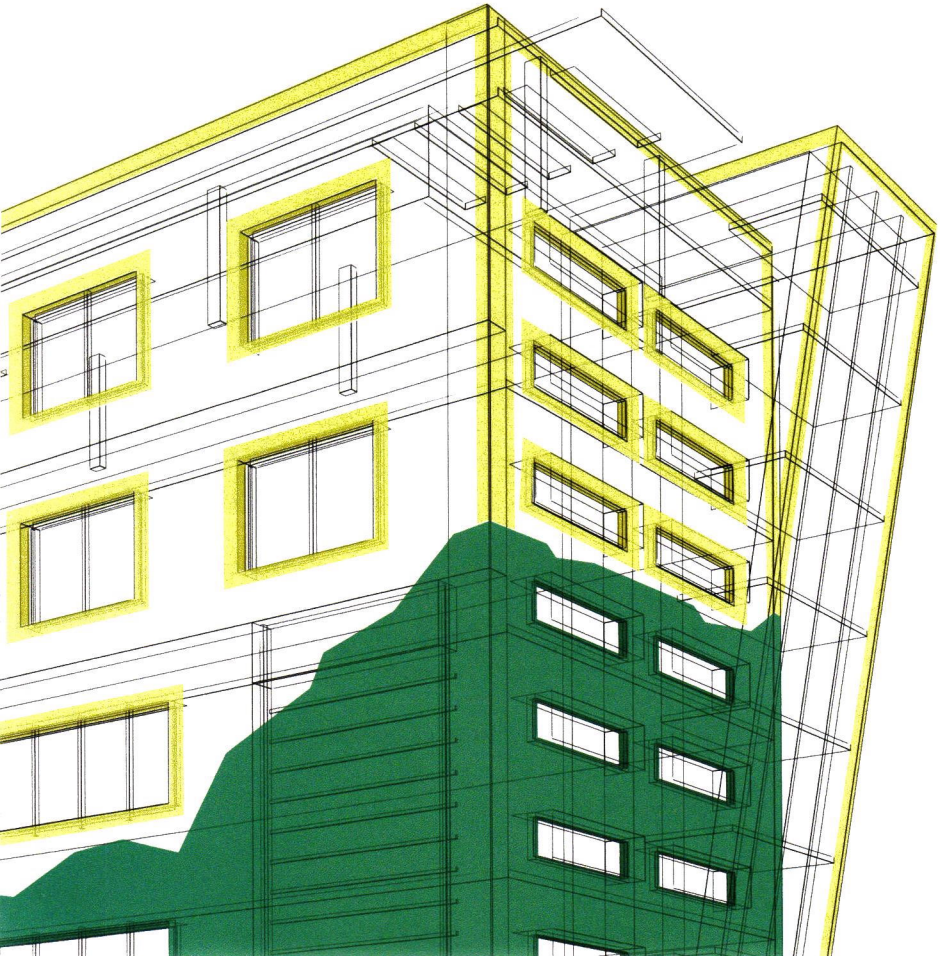
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A subtle but radical redesign of the Arch grounds in St. Louis opens this month.

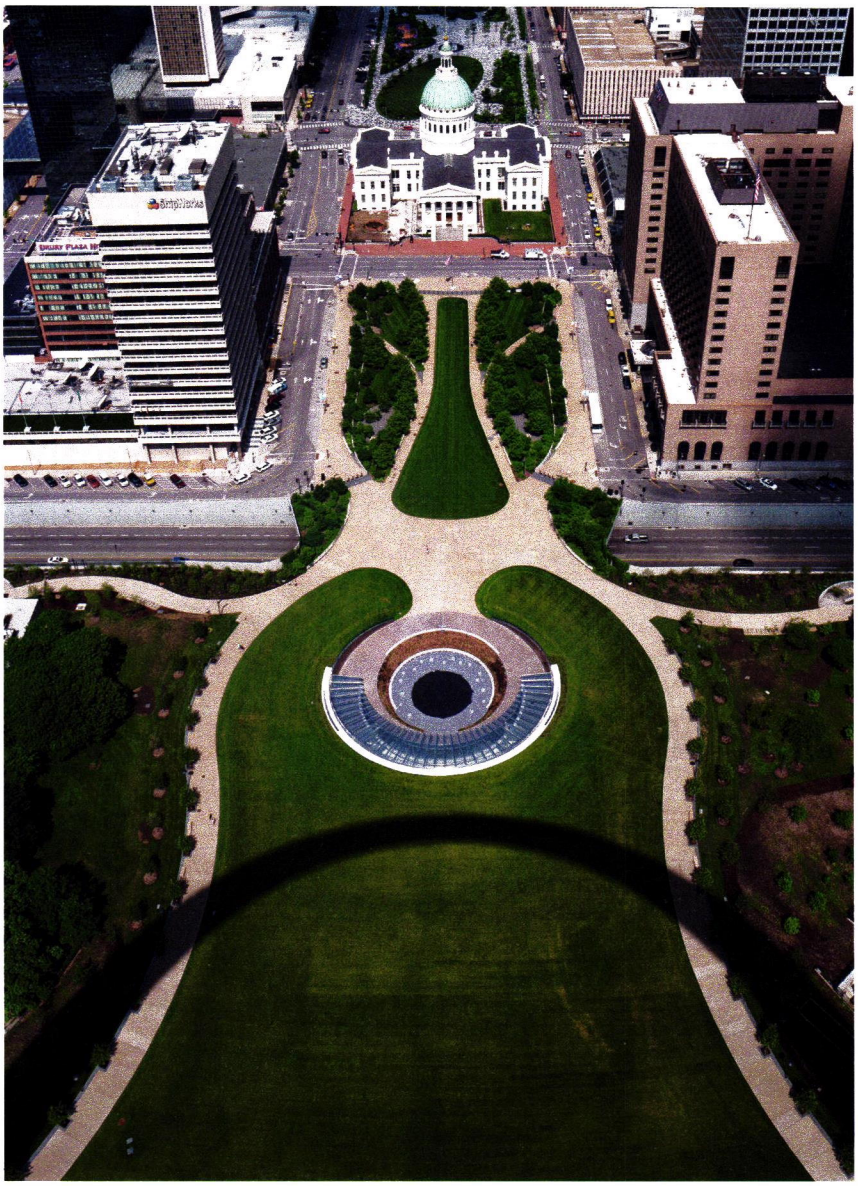
BY JOSEPHINE MINUTILLO

IT'S ONE of the most recognizable structures in the world and a national historic landmark, yet the true vision for the Gateway Arch in St. Louis was never fully realized. Eero Saarinen's simple but brilliant design created a breathtaking stainless-steel catenary arch that soars 630 feet above the Mississippi River, but the final scheme at ground level left much to be desired. Saarinen died long before the project was completed in 1967—nearly 20 years after he emerged from behind the shadow of his famous father, Eliel, with his competition-winning entry for a memorial to commemorate westward expansion. The landscape architect Dan Kiley, a close collaborator of Saarinen's on the project for years, was let go from the team not long after Saarinen's death in 1961. "The monument was supposed to represent a gateway to discovery;



The redesigned park includes a new land bridge over the highway, which connects it to downtown St. Louis, and an expanded museum as its centerpiece.

PHOTOGRAPHY: © NIC LEHOUX (EXCEPT AS N





The new museum entrance is on axis with the Arch and the Old Courthouse (above). The road along the riverfront was raised about 4 feet, eliminating up to 70 percent of the high-frequency low-flood events, and the site itself was planted with 3,415 new trees; swirling paths replace the torn-down garage (above, right). The grounds feature nearly a mile of new, accessible circulation loops with bikeways (opposite, bottom).

instead, they surrounded it in concrete," says Walter Metcalfe, a prominent St. Louisan who, as former chairman of CityArchRiver (now Gateway Arch Park Foundation), launched the 2010 competition to redesign the Arch grounds and raised money for their rebuilding.

The biggest drawback was the barrier formed by multiple lanes of traffic, including the sunken Interstate 44, that cut the Arch off from nearby downtown St. Louis. Another was the large garage that was unceremoniously plopped on the northern edge of the 91-acre national park site, just beside the landmark Eads Bridge. That combination created a scenario in which most visitors—whose numbers fluctuate between 2 and 3.5 million a year—would park their cars, walk to a base on either side of the Arch, take the tram ride up to its top, then drive away without ever visiting the underground museum just below the Arch, or the city, a down-on-its-luck Midwest metropolis whose best days seemed to be behind her.

So the hope for the redesign was not only to bring the grounds closer to Saarinen's and Kiley's original vision, but to spark a major urban-regeneration project. "The idea was to put feet on the street," says Metcalfe. "From an economic standpoint, keeping visitors to the Arch in the city for even a half day longer would be equivalent to another Cardinals baseball season."

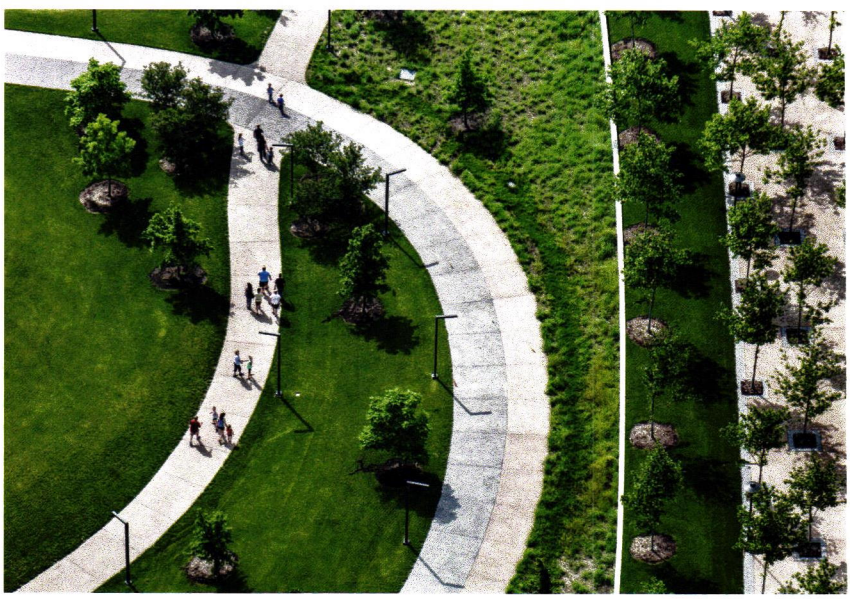
In September 2010, a team led by landscape architecture firm Michael Van Valkenburgh Associates (MVVA) was selected to take on the enormous challenge, which involved coordinating among almost 30 different agencies including the National Park Service, the Missouri Department of Transportation, the Coast Guard, and the City of St. Louis, as well as local businesses. "If what was there wasn't already so good, it might have been difficult to get through the process," says Van Valkenburgh.

MVVA's scheme, developed with Cooper Robertson and James Carpenter Design Associates, is not about big gestures. Instead, its moves are subtle but very deliberate. Most discernibly, it sets up an east–west axis—previously implied but sliced by the highway—running through the center point of the Arch. A new land bridge straddles the highway,

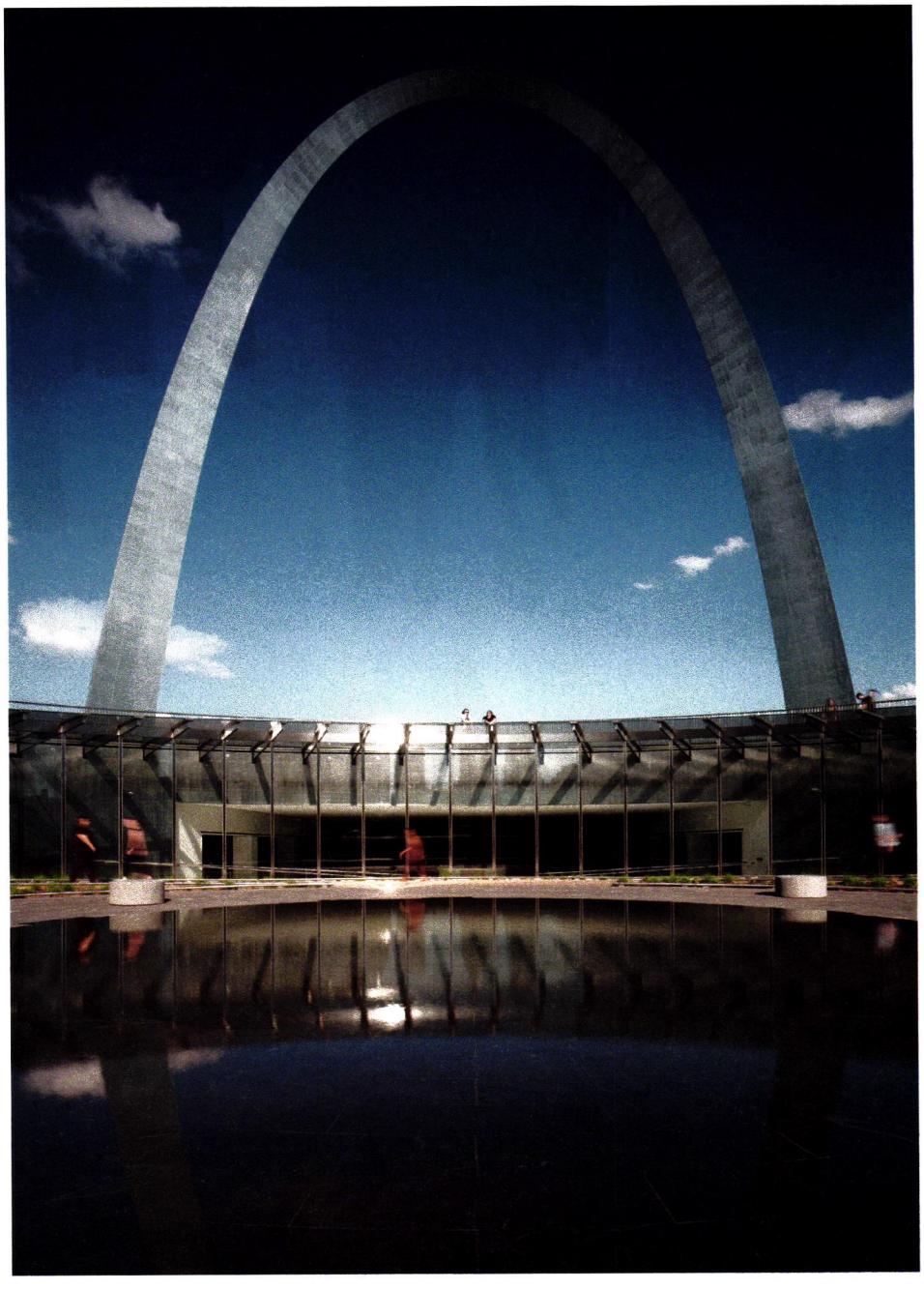
organically connecting visitors to the project from downtown. In order to ride the tram to the top, one must now enter the Arch through the newly expanded museum, which appears unobtrusively at grade in the form of a circular steel and glass canopy, the main architectural component and centerpiece of the project. That axial progression continues in the opposite direction as well, with the bridge connecting to the previously sunken and now redesigned Luther Ely Smith Park, which fronts both the historic Old Courthouse building on the edge of downtown and a series of landscaped plazas lined up to the west, designed as part of the City Beautiful movement a century ago. "We reinvented the choreography of how you enter this place," says MVVA principal Gullivar Shepard.

According to Metcalfe, "Michael's was the lightest but most complete touch" of the designers in the competition; the jury said MVVA struck the proper balance of reverence for the existing site and new ideas to invigorate it. "I'm the last person in the world to give credit to an architect for a landscape design that he or she didn't do," admits Van Valkenburgh, "but the forms on the ground were forms Saarinen was preoccupied with. I am in awe of what he and Kiley did in collaboration."

The awful garage was one of the first things to go, along with several



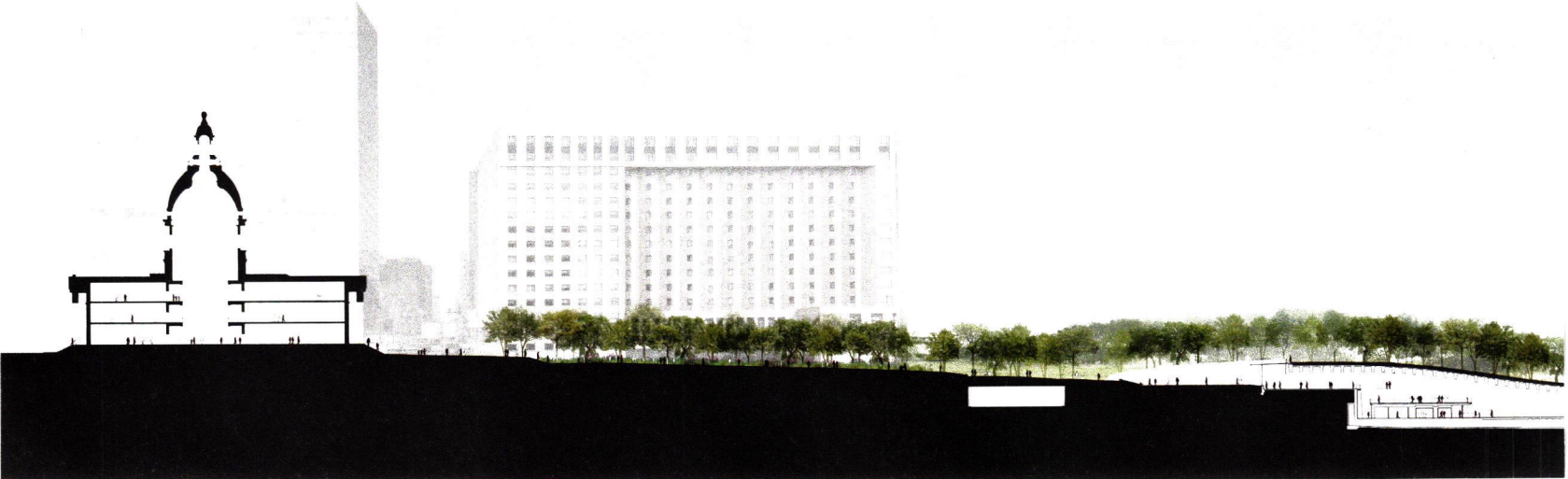
PHOTOGRAPHY: © ALEX S. MACLEAN (ABOVE AND RIGHT)



small service buildings on the grounds, replaced with lawn and swirling paths. Deals were struck with underused parking facilities within several blocks of the park to offer a special rate to visitors to the Arch, who can now walk from downtown to the site over the new pedestrian bridge that traverses I-44 where it lines up with the Arch. The highway's retaining walls dictated the maximum depth for the new museum entrance, which is shielded in blast-proof glass and tucked beneath a berm as it circles around a pool of water, allowing in visitors on either side. "We wanted to create the experience not of descending but of moving into the earth," explains James Carpenter. The surprisingly luminous subterranean space—made so through a series of custom aluminum tubes with integrated uplighting that shines onto a highly reflective aluminum ceiling—includes 47,000 square feet for ticketing, coat check, and new displays. The entire exhibition, including the renovated portion of the existing, connected museum, was reimagined and designed by UK-based Haley Sharpe Design.

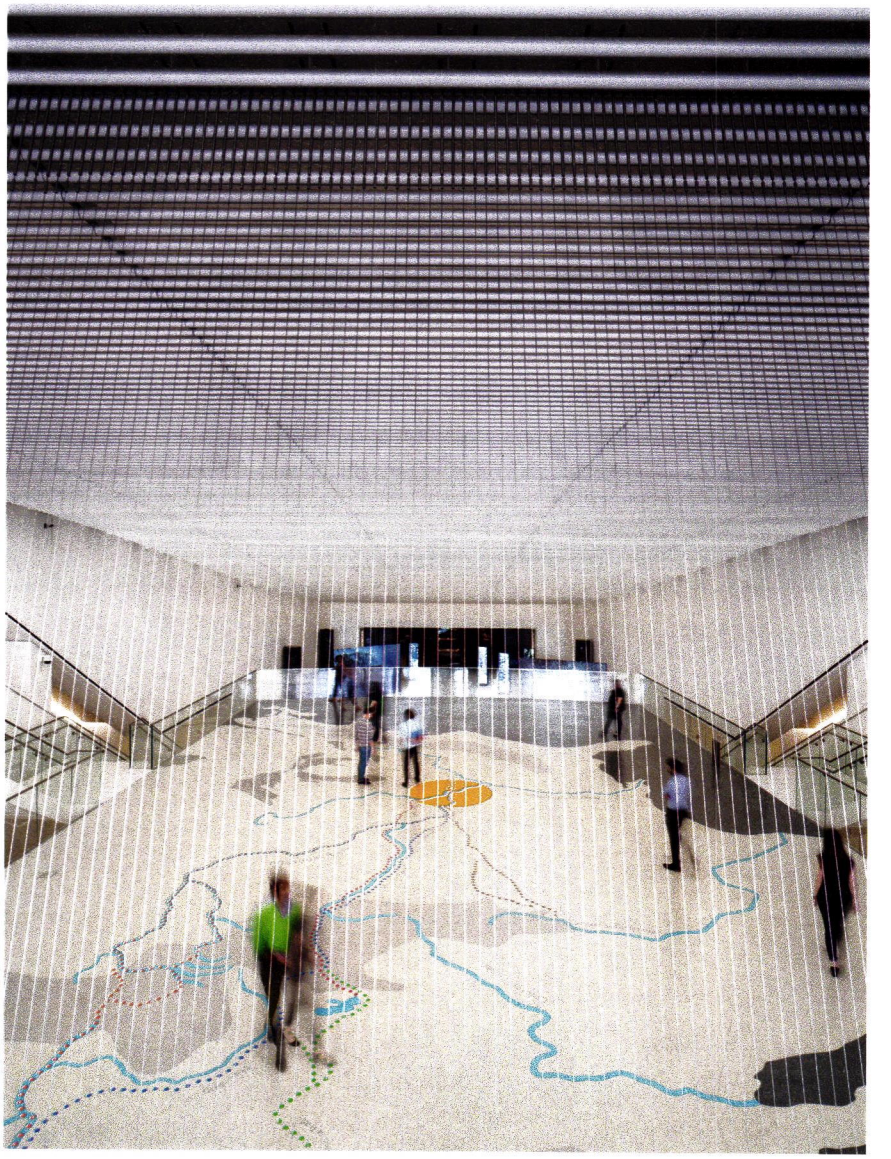
The curving path of the entrance saw many iterations, including a version that arced in the opposite direction. The final design for how one moves through the site reflects in plan the Arch in elevation. It also reflects a strict adherence to universal design standards, which—by going beyond ADA regulations—offers the same experience to all visitors, as do the thousands of linear feet of new pathways and loops throughout the park.

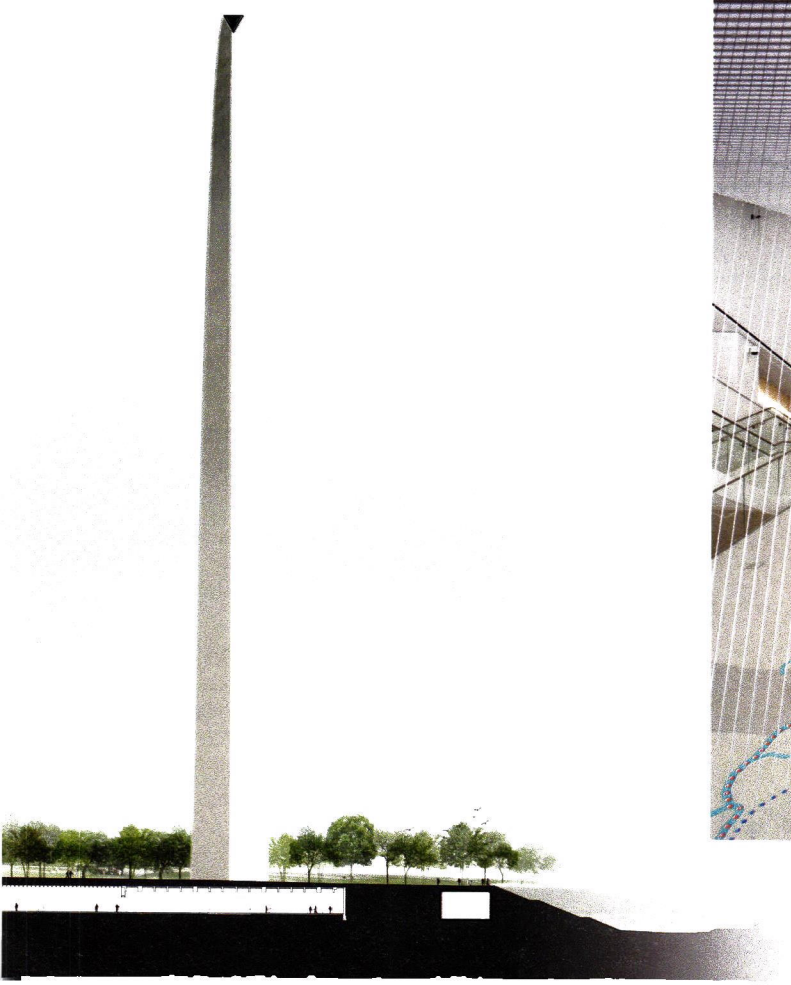
The previously inaccessible grounds, which comprise 40 feet of grade change, were completely overhauled. For one thing, the existing 900 ash trees—which were not specified by Kiley and were left to grow in highly compacted construction fill—never thrived. They have been replaced with London planes, a species that has a form similar to Kiley's original renderings and is not susceptible to a destructive beetle encroaching on the region. New light poles, based on Saarinen's original drawings but never before produced, were developed by St. Louis firm Randy Burkett Lighting Design, in collaboration with lighting manufacturer Louis



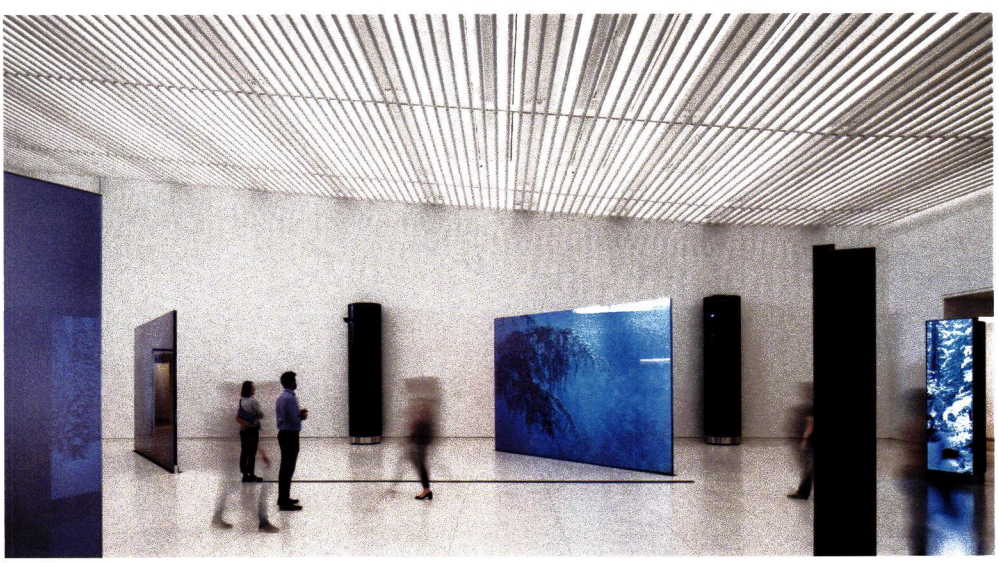


The new entrance and canopy, beside a reflecting pool, are composed of milled stainless steel and blast-proof glass (opposite), while its interior offers views of the Old Courthouse (above). The luminous underground space features a highly reflective aluminum ceiling over uplit aluminum tubes, and white terrazzo floors (right). A section of downtown St. Louis (below) depicts the axial progression from the Old Courthouse to the newly expanded museum beneath the Arch.









The centerpiece of the project offers a new civic space (left). The displays inside include thin, translucent screens onto which videos are projected (bottom).

Poulsen, and added along the pathways.

A litany of other important but less perceptible interventions, including flood mitigation, was part of the strategic design, which was executed and backed by a consortium of entities, including St. Louisans themselves, who voted to increase their own taxes to help pay for the $380 million effort. While it proved impossible to realize some of the competition goals—such as a connection to the opposite bank of the Mississippi, in East St. Louis—the incremental improvements to St. Louis's downtown, from food trucks and other amenities along the riverfront to planned construction of a significant number of new downtown housing units, will ultimately bring to fruition the project's main objective of uniting city, river, and Arch.

With one of the biggest architectural gestures ever built looming overhead, MVVA's team wisely avoided creating another. Instead, they brought the Arch down to the ground—visually and experientially—creating a new civic space in the process. ■

credits

LANDSCAPE ARCHITECT: Michael Van Valkenburgh Associates

ARCHITECT: Cooper Robertson – Scott Newman, partner in charge; Andrew Barwick, project architect

ASSOCIATE ARCHITECT: James Carpenter Design Associates, Trivers Associates

CONSULTANTS: Eckersley O'Callaghan (structural glazing, facade); Tillotson Design Associates (building lighting design)

GENERAL CONTRACTOR: McCarthy Building Companies

CLIENT: Gateway Arch Park Foundation (formerly CityArchRiver)

COST: $380 million (total); $96 million (museum)

COMPLETION DATE: July 2018

SOURCES

STEEL AND GLASS ENTRY ENCLOSURE: Seele, Sedak

OTHER GLAZING: Oldcastle BuildingEnvelope

METAL DOORS: Assa Abloy

EXIT DEVICES AND HARDWARE: C.R. Laurence

MOISTURE BARRIER: Xypex, Laurenco

ALUMINUM-TUBE CEILING WITH INTEGRATED LEDS: Durlum, Nanometer

DOWNLIGHTS: Usai, Electrix, LiteLab, Linear Lighting, Bartco, Lithonia, Zumtobel, Selux

EXTERIOR LIGHTING: Lithonia, Bega, Louis Poulsen

PLASTIC LAMINATE: Wilsonart

SOLID SURFACING: DuPont Corian

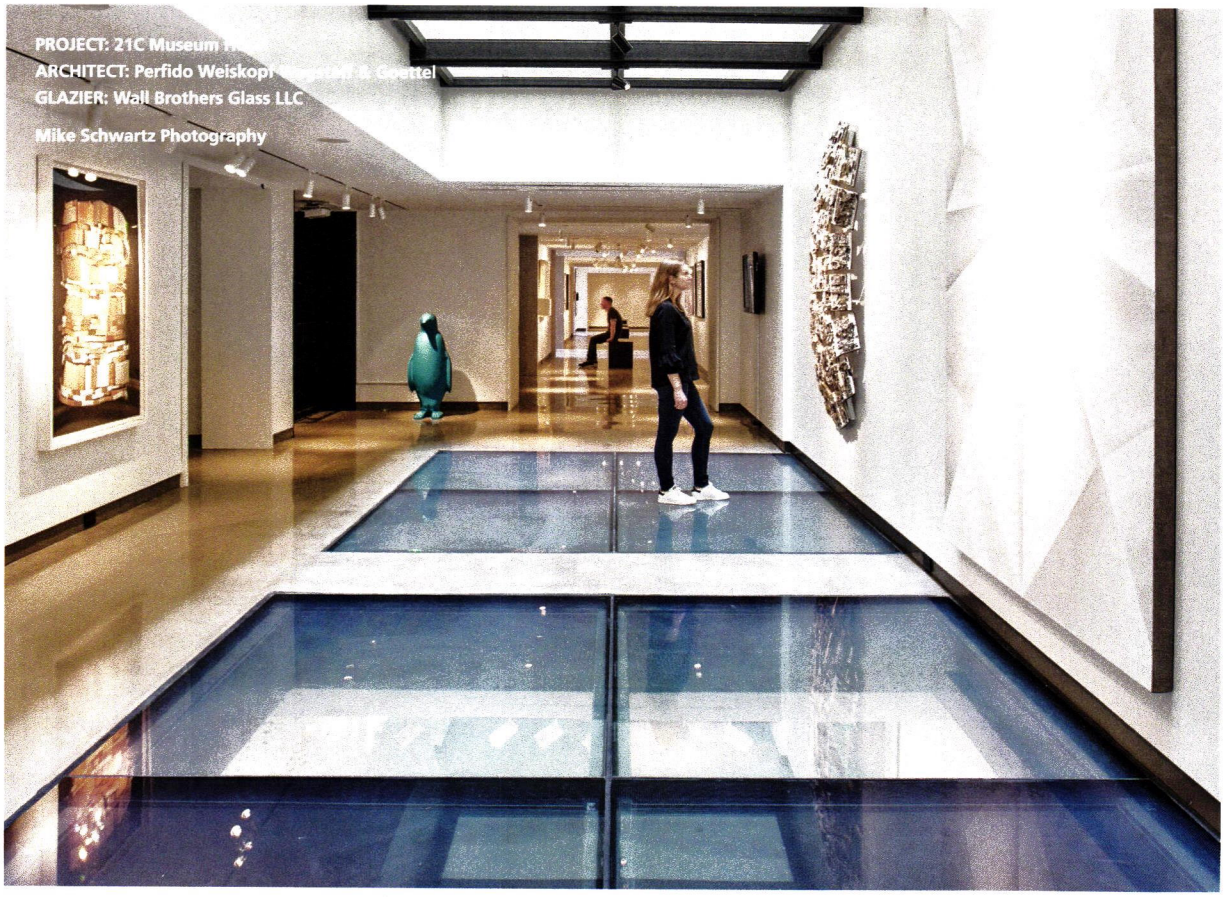
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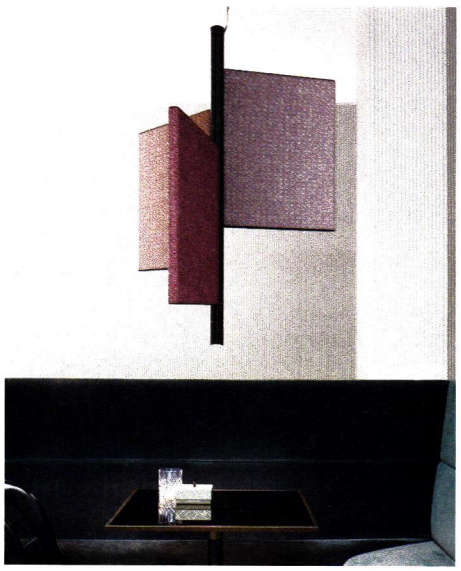
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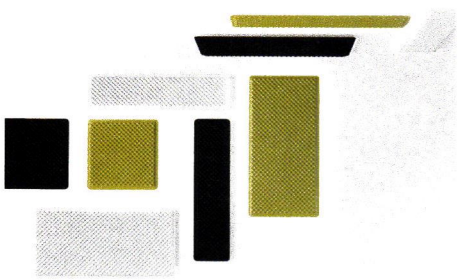
By Kelly Beamon



Trypta

This pendant is the latest in Luceplan's growing line of acoustic fixtures. Ambient sound is dampened by three fabric-covered panels slotted into its central painted-aluminum column, which also houses a dimmable 2700K LED, offers direct and indirect diffused light, and a high color-rendering index of 90. Designed by Stephen Burks, Trypta is available in 35" or 47" lengths, with panels in seven heights.

luceplan.com



Eggboard Wall/Ceiling

New wall and ceiling versions of Artemide's Eggboard, a system of modular LED lighting/acoustic solutions, appear to float as they glow. First designed in 2012 by Giovanni Giacobone and Massimo Roj of Progetto CMR, the line of PET panels and optional light modules has been steadily expanded with suspension fixtures and surface-grazing backlights.

artemide.com



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buzzi.space



Vapor Echo Rectilinear

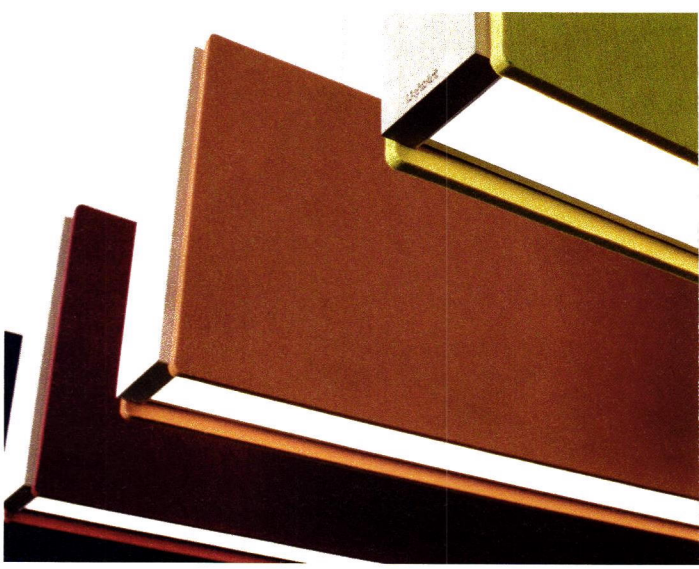
This 17"-tall shade from Luxxbox is available in three widths, from 22" (shown) up to more rectangular 40" and 58" widths, generously sized to optimize the ½"-thick acoustic panels. They have a noise reduction coefficient (NRC) of 0.45 to 0.70.

luxxbox.com

Static

To update Static, the beam-shaped lighting/acoustic solution that LightArt debuted last year, the Seattle manufacturer has rolled out a rainbow of new hues for its PET felt panels, as well as optional metal endplates in custom colors. The assembled fixture boasts an NRC rating of 0.8 to a high-quality rating of 1.

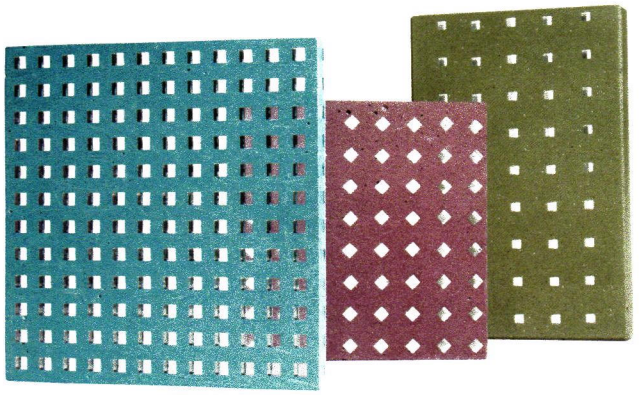
lightart.com



Glazed and Infused

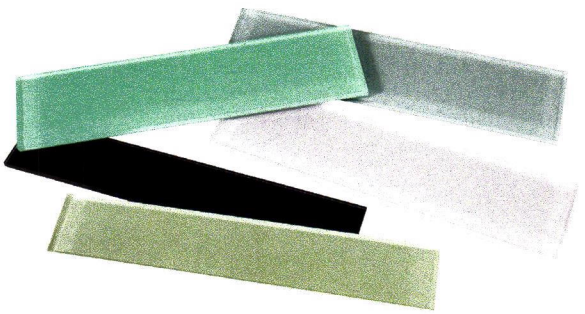
Metals, concrete, and saturated color add new dimensions to this transparent category.

By Kelly Beamon



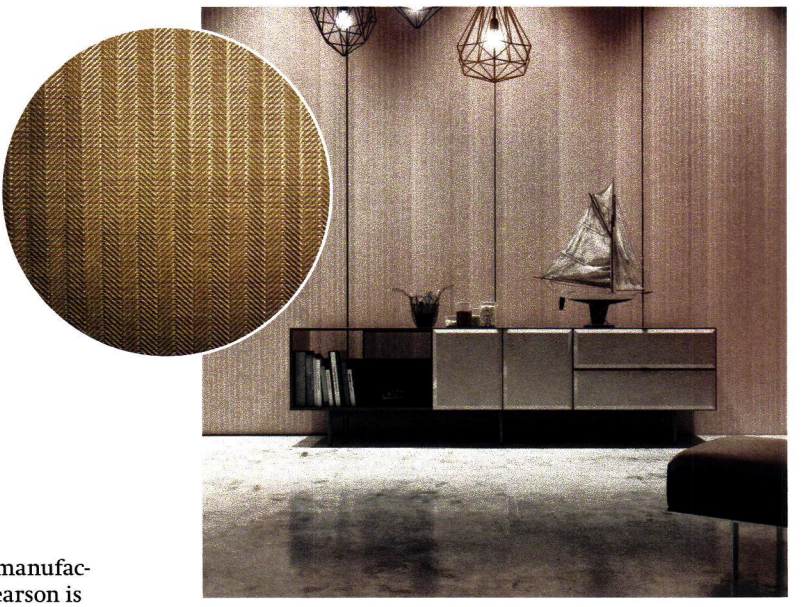
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Metallic

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carvart.com



Spindrift

Island Stone's glass mosaics may have the appearance of random, individually applied pebbles but actually come in pre-formatted 12"-square mats with an opaque white backing. Designers can specify Spindrift for wet floors and walls even in outdoor pools. The pattern is flat underfoot.
islandstone.com



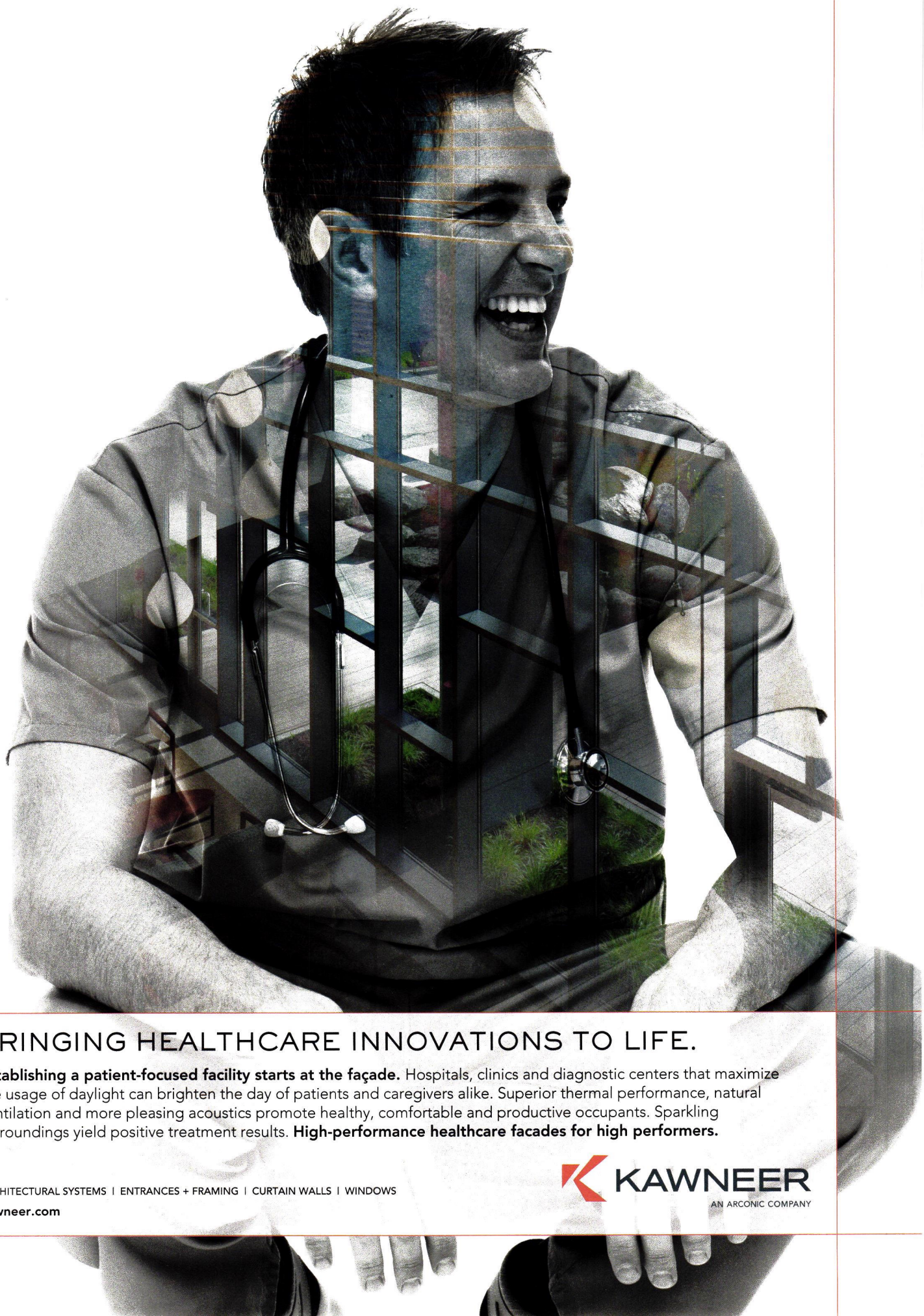
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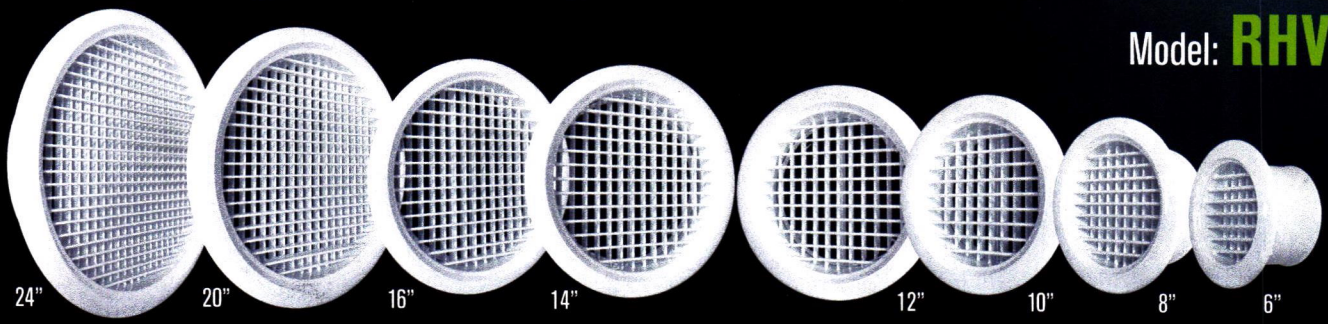
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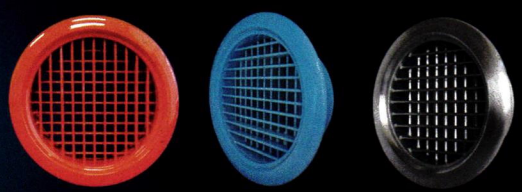
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Model: **TT**

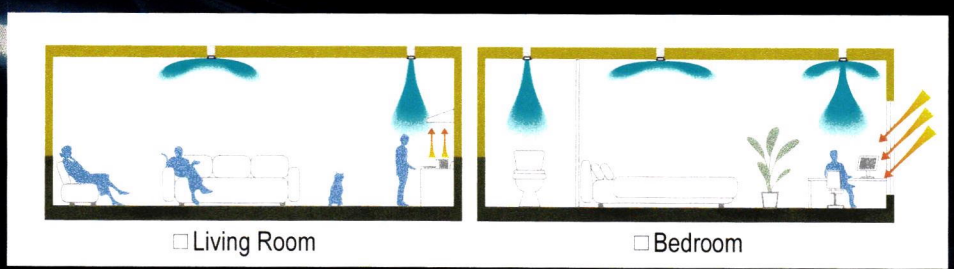
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Model: **TX**

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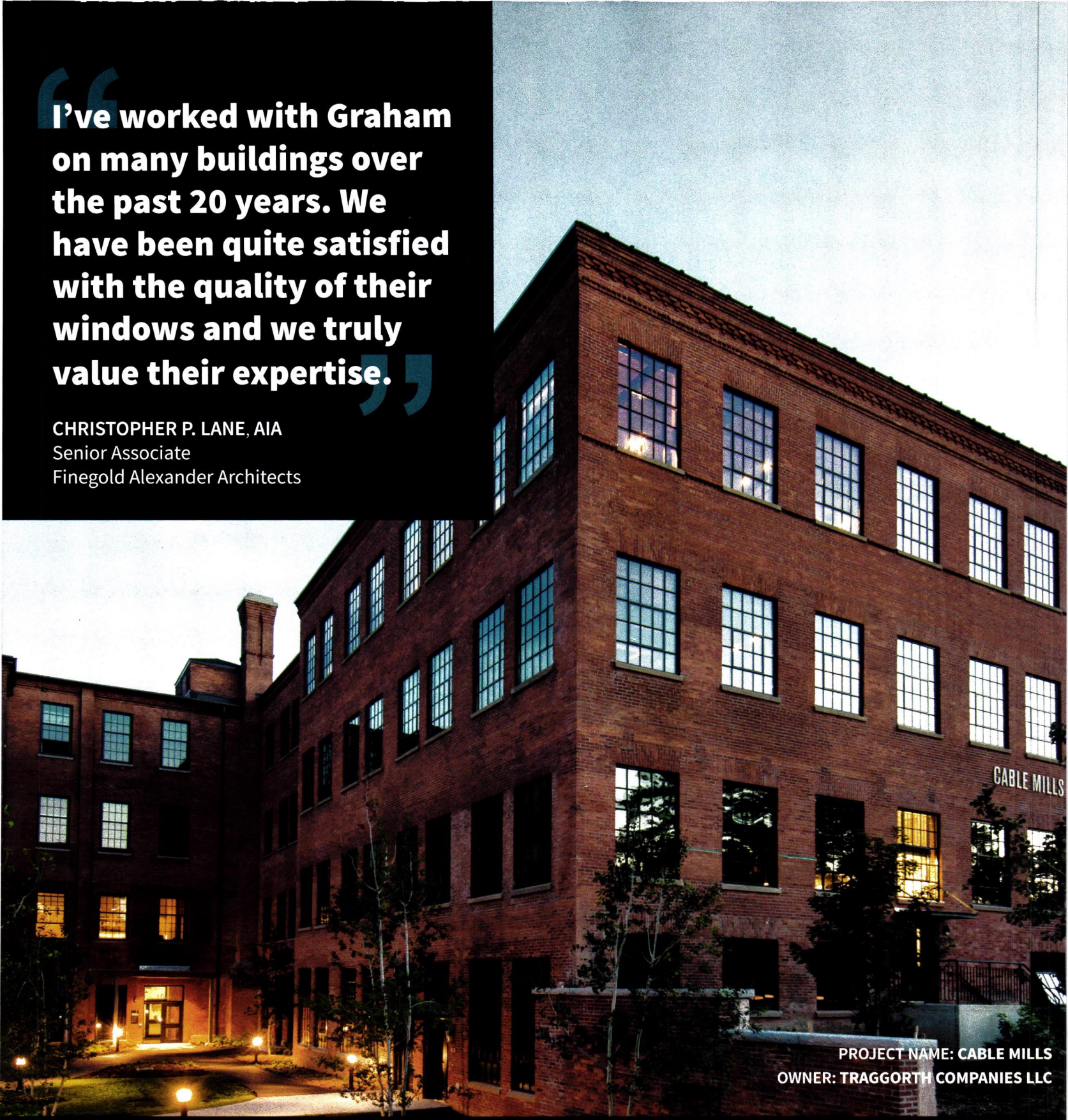
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TALL BUILDINGS

Most architects of tall buildings will admit that height for height's sake is an empty pursuit: there is so much more involved than garnering a spot in the record books. The towers on the following pages bear this out. They make their mark with inventive facades, innovative structural systems, and new strategies for defining public space—and they still meet the sky in graceful ways.



SALESFORCE TOWER, SAN FRANCISCO, PELLI CLARKE PELLI ARCHITECTS

PHOTOGRAPHY: © JASON O'REAR

Continuing Education

To earn one AIA learning unit (LU), including one hour of health, safety, and welfare (HSW) credit, read four stories in the tall buildings section, review any supplemental material found at architecturalrecord.com, and complete the quiz at continuingeducation.bnpmedia.com or by using the Architectural Record CE Center app available in the iTunes Store. Upon passing the test, you will receive a certificate of completion, and your credit will be automatically reported to the AIA. Additional information regarding credit-reporting and continuing-education requirements can be found at continuingeducation.bnpmedia.com.

Learning Objectives

1 Discuss earthquake-resistant technologies suitable for tall buildings and alternatives to code-prescribed seismic-design methods.

2 Describe several types of envelope systems that can reduce heat gain and glare.

3 Describe strategies for ensuring occupant comfort suited to tall buildings and diverse climates.

4 Discuss ideas for creating public space within dense urban environments.

AIA/CES Course #K1807A

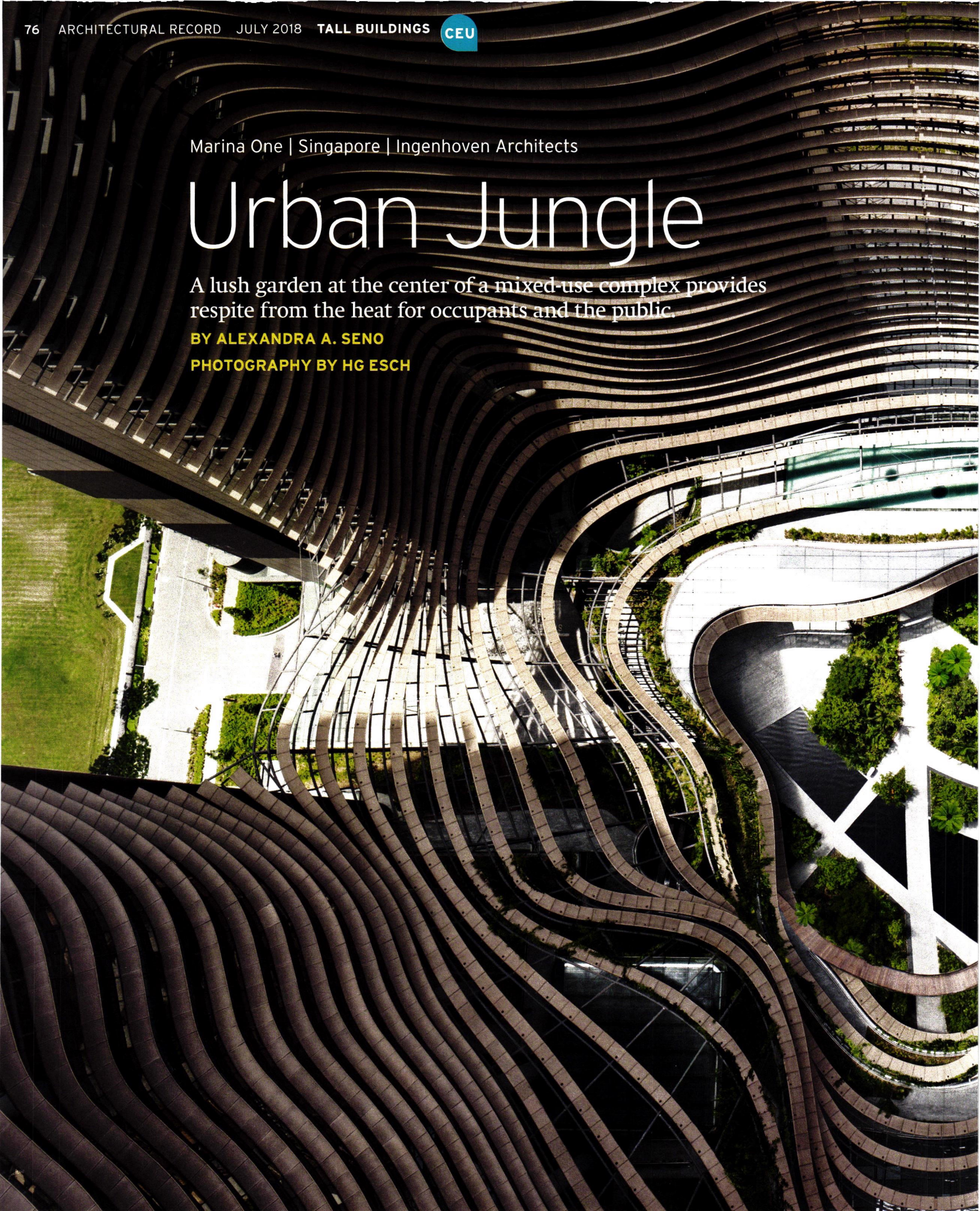
Marina One | Singapore | Ingenhoven Architects

Urban Jungle

A lush garden at the center of a mixed-use complex provides respite from the heat for occupants and the public.

BY ALEXANDRA A. SENO

PHOTOGRAPHY BY HG ESCH



GREEN OASIS Tropical gardens, atop a podium and on several levels, are the centerpiece of Marina One, an apartment and office-building complex in Singapore.



The public space in the middle of Singapore's recently completed Marina One complex provides genuine respite. Above the district of concrete-and-glass towers, the noonday sun beats down relentlessly. But even though temperatures in this tropical city regularly tip to over 90 degrees Fahrenheit and humidity often hits 95 percent, it is a refreshing experience to walk through the center of this new development. Here wood and stone paths are surrounded by lush plants and trees that sway gently in an unexpected breeze.

Marina One, which opened at the end of last year, is built on four lots of reclaimed land totaling 6.5 acres in Marina Bay, the city-state's expansion of it business district. The 4.3 million-square-foot complex has two 750-foot-tall 30-story office towers and two 475-foot-tall 34-story residential towers, linked on the lower levels with a podium that hosts the gardens and encloses dining and retail outlets. The assemblage sits atop underground passages with direct access to four of the city's six metro lines.

The ambitious mixed-use center emerged



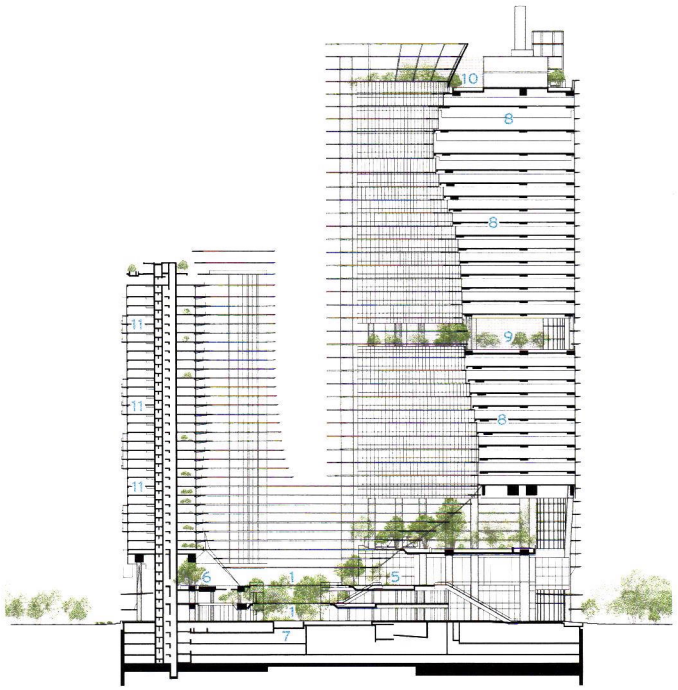
DESIRABLE DENSITY Thousands of people will eventually live and work in Marina One's four towers (top)—a pair each for residential units and for offices. The gardens at the center of the complex (opposite, top and bottom) include a network of ramps and pathways that link the buildings. The reflective material on the ceiling of the office lobby (above) helps bring these gardens inside.





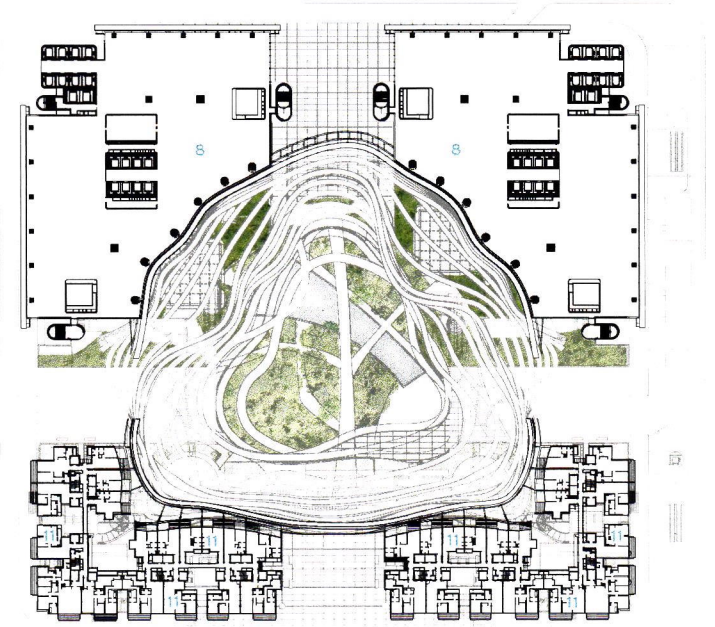
out of a partnership between the state-owned investment funds of Malaysia and Singapore. In 2011, the entity named Dusseldorf, Germany–based Ingenhoven Architects the winner of an international competition. One typical approach to maximize the built volume would be to create a cube approximately 650 feet on each side and 650 feet tall. But "temperature and humidity would be working against the human condition" with such an arrangement, explains the firm's founder, Christoph Ingenhoven. So, instead, he and his team created an ensemble clad in glass and bronze-hued metal and supported by reinforced-concrete or steel structures, carving it—and curving it—to define 398,000 square feet of gardens. This greenery is more than decorative. It contributes to the comfortable microclimate at the base of the complex, and is accessible to all, not just the center's tenants and residents. "We have created an oasis," says Olaf Kluge, director of the local Ingenhoven office.

One advantage of designing this kind of environment for Singapore is the year-round growing season, points out Kathryn Gustafson, founder of Gustafson Porter + Bowman (GP+B).



SECTION A - A

0 100 FT. 30 M.



TYPICAL-FLOOR PLAN



GROUND-FLOOR PLAN

0 100 FT. 30 M.

1 GARDEN
2 OFFICE ARRIVAL LOBBY
3 RETAIL
4 RESTAURANT
5 OFFICE LOBBY
6 RESIDENTIAL AMENITIES
7 PARKING
8 OFFICE
9 SKY GARDEN
10 ROOF GARDEN
11 APARTMENT

The London-based landscape architecture firm, which is separate from Gustafson's Seattle-based practice, developed the gardens in partnership with local ICN Design International. Still, a prime concern was selecting bushes and shrubs that would thrive even under the shade of trees and the buildings' long shadows. But such practicalities weren't Gustafson's only interest. "It's about the leaf," she says. "Texture, size, and color are important." Toward that end, the two firms selected 350 varieties of tropical plants.

Although the buildings' street-facing elevations are rectilinear and almost conventional, from within the green heart, the towers are much more organic. The facades appear to undulate, an effect that is enhanced by curving metal louvers—which help shade both the gardens and the glazing—and by the floor plates of the office blocks. These increase in size in the upper levels of the buildings, achieved by canting the garden-facing support columns.

Within each of the office towers, the designers created nearly 1.9 million square feet of unobstructed rentable space by limiting the columns so that they are mainly on the buildings' perimeters. In addition, they placed the elevators to the upper floors within their own silos, at the buildings' corners. The configuration allowed for glass-enclosed capsules facing Straits View, the boulevard that hosts the complex's main entrance. So far, space has been leased by firms that include Facebook and the banks Julius Baer and Mitsubishi UFJ Financial Group.

The residential towers have four penthouses with features like oversize terraces with their own swimming pools. However, the vast majority of the more than 1,000 condominium apartments are smaller one- to four-bedroom units. But though these are more modest, all have balconies, many with views of the gardens or of the rapidly developing neighborhood, including its many construction sites, Moshe Safdie's nearby Marina Bay



CONTOURS AND CURVES Ribbonlike metal louvers, which shade the buildings' glazing and the central green space, help make the garden-facing facades appear to undulate.

Sands Hotel, and the soon-to-be-relocated container port.

Marina One is rational without being conventional—daring and quirky while very functional for the more than 20,000 people who will eventually live and work there. But, above all, it aims to enhance not only the well-being of its occupants, but that of anyone in the area, welcome to enjoy its serene and verdant gardens. "It is a very high-density development," explains Ingenhoven. "If you do density like that, you also need to be generous." ■

Alexandra A. Seno is a Hong Kong–based architecture and design critic who has written for The Wall Street Journal *and* The New York Times, *among other publications.*

credits

ARCHITECT: Ingenhoven Architects – Christoph Ingenhoven, principal; Martin Reuter, Olaf Kluge, directors

ASSOCIATE ARCHITECT: architects61

CONSULTANTS: Beca Carter Holdings & Ferner (structure, m/e/p, fire); Langdon & Seah (quantity surveyor); Gustafson Porter + Bowman, ICN Design International (landscape); Arup (facade, lighting, vertical transport); Axis ID (residential interiors)

GENERAL CONTRACTOR: Hyundai-GS Joint Venture

CLIENT: M+S Pte.

SIZE: 4.3 million square feet

CONSTRUCTION COST: $1.35 billion

COMPLETION DATE: November 2017

SOURCES

SOFFITS: Alucobond

PODIUM CURTAIN WALL: Mero Asia Pacific

TOWER CURTAIN WALL: Yuanda Curtain Wall

CEILINGS: Sunray Woodcraft Construction

GLASS: China Specialty Glass

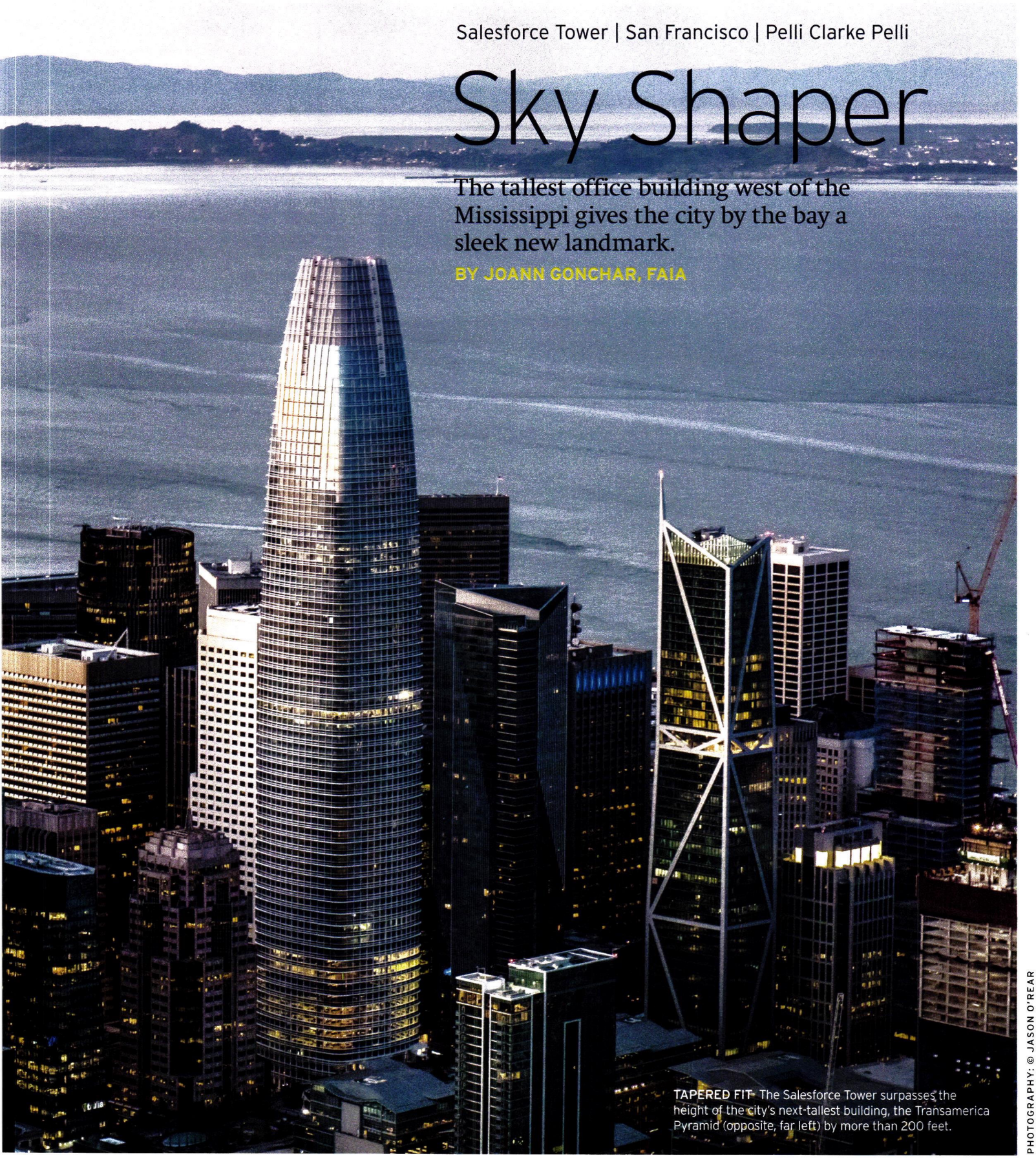


Salesforce Tower | San Francisco | Pelli Clarke Pelli

Sky Shaper

The tallest office building west of the Mississippi gives the city by the bay a sleek new landmark.

BY JOANN GONCHAR, FAIA



TAPERED FIT The Salesforce Tower surpasses the height of the city's next-tallest building, the Transamerica Pyramid (opposite, far left) by more than 200 feet.

PHOTOGRAPHY: © JASON O'REAR



The Salesforce Tower has been an undeniable presence on San Francisco's skyline for some time—since long before the spring of 2017, when it topped out. But now, with the completion of the 61-story, 1,070-foot-tall skyscraper earlier this year, the Pelli Clarke Pelli Architects–designed project has officially earned the titles of the city's tallest structure and the tallest office building west of the Mississippi.

Of course, critics have decried the Salesforce Tower as the inappropriate Manhattanization of San Francisco. But though it is big (it encloses 1.4 million square feet) and is highly visible, it doesn't loom. Square in plan, with rounded corners, the top third of the obelisk softly tapers. And while it might seem at first glance to be just another glass-clad tower that could have been built anywhere, it has features that make it a fitting symbol of this rapidly changing city and its startup economy, including a 150-foot-tall perforated-metal screen at the pinnacle: by day it helps the building's top dissolve into the sky and conceals unsightly mechanical equipment, but at night, the scrim transforms into a giant canvas for an installation by local LED artist Jim Campbell.

Surpassing San Francisco's former record holder, the 1972 Transamerica Pyramid, by more than 200 feet, the Salesforce Tower is nearly impossible to miss from almost any spot in San Francisco and beyond. But, at one point, it was not clear if the project—whose gestation period ended up being more than 10 years—would even get off the ground. In 2007, the developer Hines and architects Pelli Clarke Pelli won a competition with their proposal for the skyscraper and an adjacent transit hub, with a 5.4-acre public park on top designed by PWP Landscape Architecture. The two buildings, then known as the Transbay Tower and the Transbay Terminal, were conceived as the centerpieces of a much larger redevelopment zone at the edge of the city's financial district, made possible in part by the demolition of an elevated freeway damaged in the 1989 Loma Prieta earthquake.

But the Great Recession that hit in late 2008 put the brakes on the tower's construction. Ground wasn't broken until 2013, after Boston Properties became the lead developer, assuming a 95 percent stake in the project. Later, the cloud-computing company Salesforce would acquire the naming rights for the skyscraper, with a lease for what would eventually total 900,000 square feet, including the two top floors. Subsequently, the company would also put its name on the transit center and the rooftop park, which are slated to open next month.

In the post-crash economic climate, the design team naturally faced pressure to be exceedingly practical. However, Fred Clarke, senior principal at Pelli Clarke Pelli, claims that no design sacrifices were made. He points to refinements like the rounded-glass corners, which consist of curved insulated glass panels rather than being assembled from faceted flat panes. And he calls out the exterior aluminum sunshades. The gridded system sits proud of the glass skin, adding texture and depth. Its white epoxy coating contains mica to make the most of the quality of light that is particular to San Francisco.

Still, there were some challenging developer demands, including a directive that there be no elements that would interfere with the tower's dramatic views or that would hinder office layouts. For the structural engineer, Magnusson Klemencic Associates, this meant that the building could not rely on the typical seismic systems generally found in skyscrapers in earthquake-prone San Francisco. "There could be no perimeter braces, no outrigger trusses, no belt trusses," says Ron Klemencic, chairman and CEO of the Seattle-based firm. Instead, the lateral system is confined to the 85-foot-square reinforced-concrete core with walls that are 4 feet thick at the base. Perimeter columns take only the gravity loads. There are three of these per face, placed about 40 feet apart, and none at the all-important curved corners or within the interior of the 25,000-square-foot floor plates. But even without a readily apparent seismic system, the tower is designed to sway 25 percent less in a quake than a more conventional one, says Klemencic.

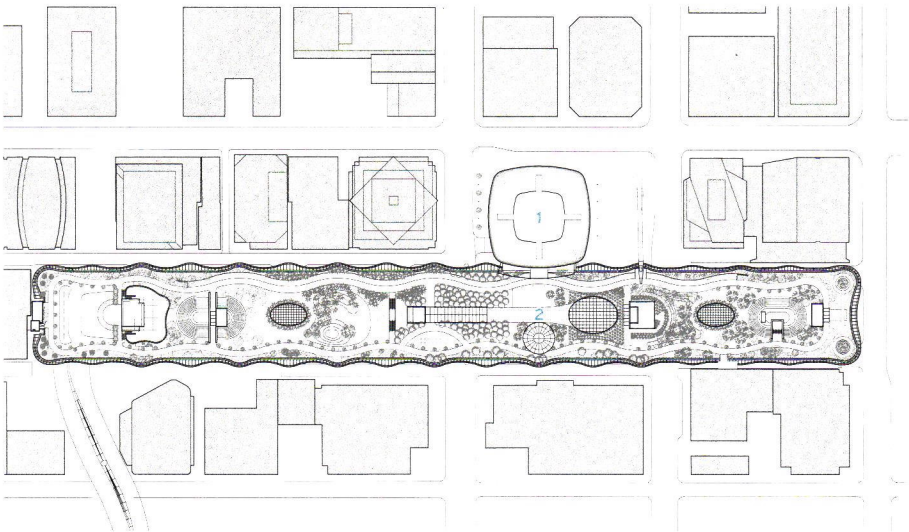
This "quiet" but robust superstructure sits on a mat foundation with piles that extend more than 300 feet to bedrock. The team made the decision to go that deep at the outset of the project, when the sinking and listing of nearby Millennium Tower was known in construction circles, but before it had been widely publicized. The condominium building's piles only go down about 70 feet, to the Colma clay layer.

But arguably more notable than the depth of the Salesforce Tower foundations, or the seemingly straightforward configuration of its superstructure, is the process used to engineer them—a methodology known as performance-based seismic design (PBSD). Under this alternative to code-prescribed techniques, designers and owners can develop an enhanced level of earthquake performance and devise a scheme tailored to that outcome.



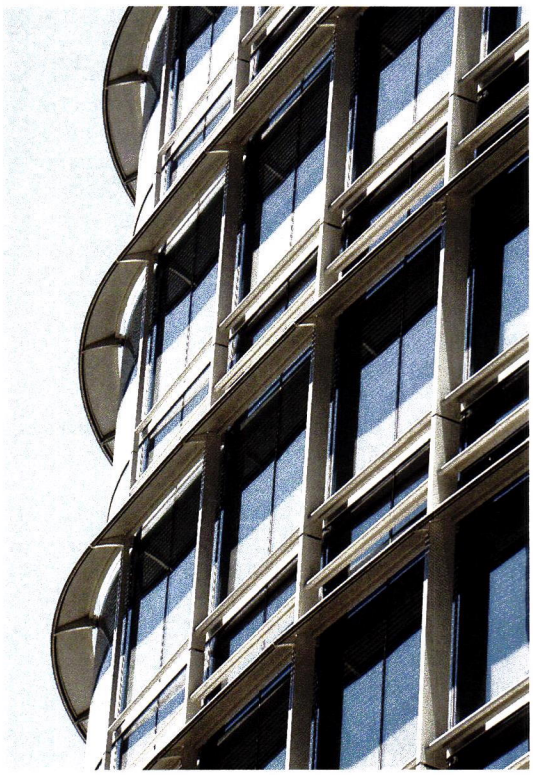
UP ON THE ROOF The tower was conceived together with a transit hub topped by a 5.4-acre public park (right). The four-block-long transit station's bus deck bridges over several streets and is enclosed in a lacelike skin (opposite, bottom of image).

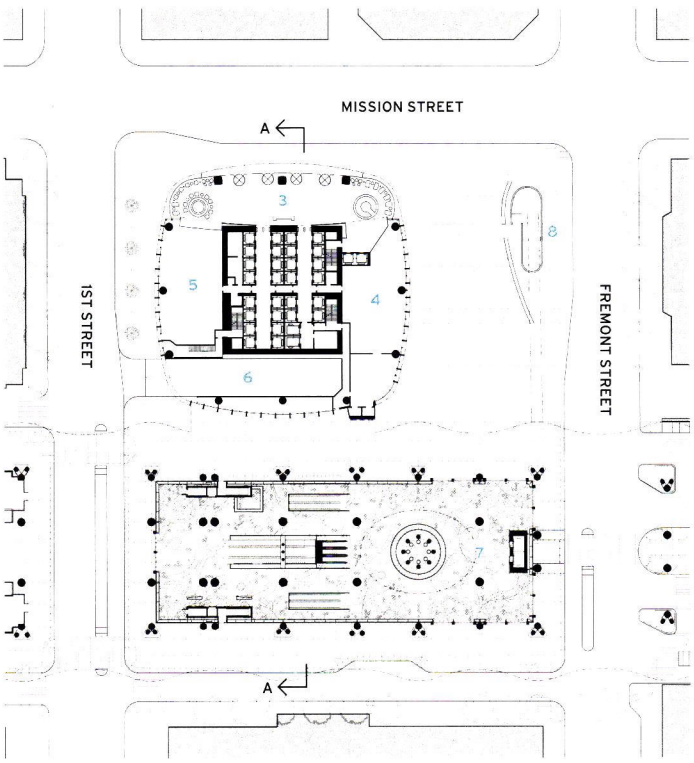
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SITE PLAN

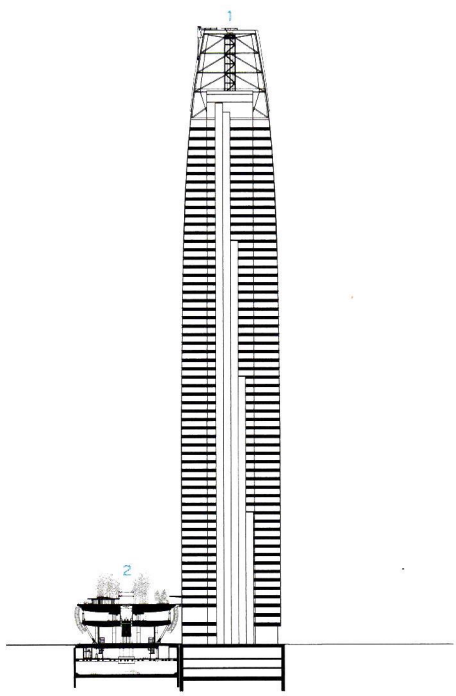
0 150 FT.
50 M.





GROUND-FLOOR PLAN

0 50 FT.
15 M.

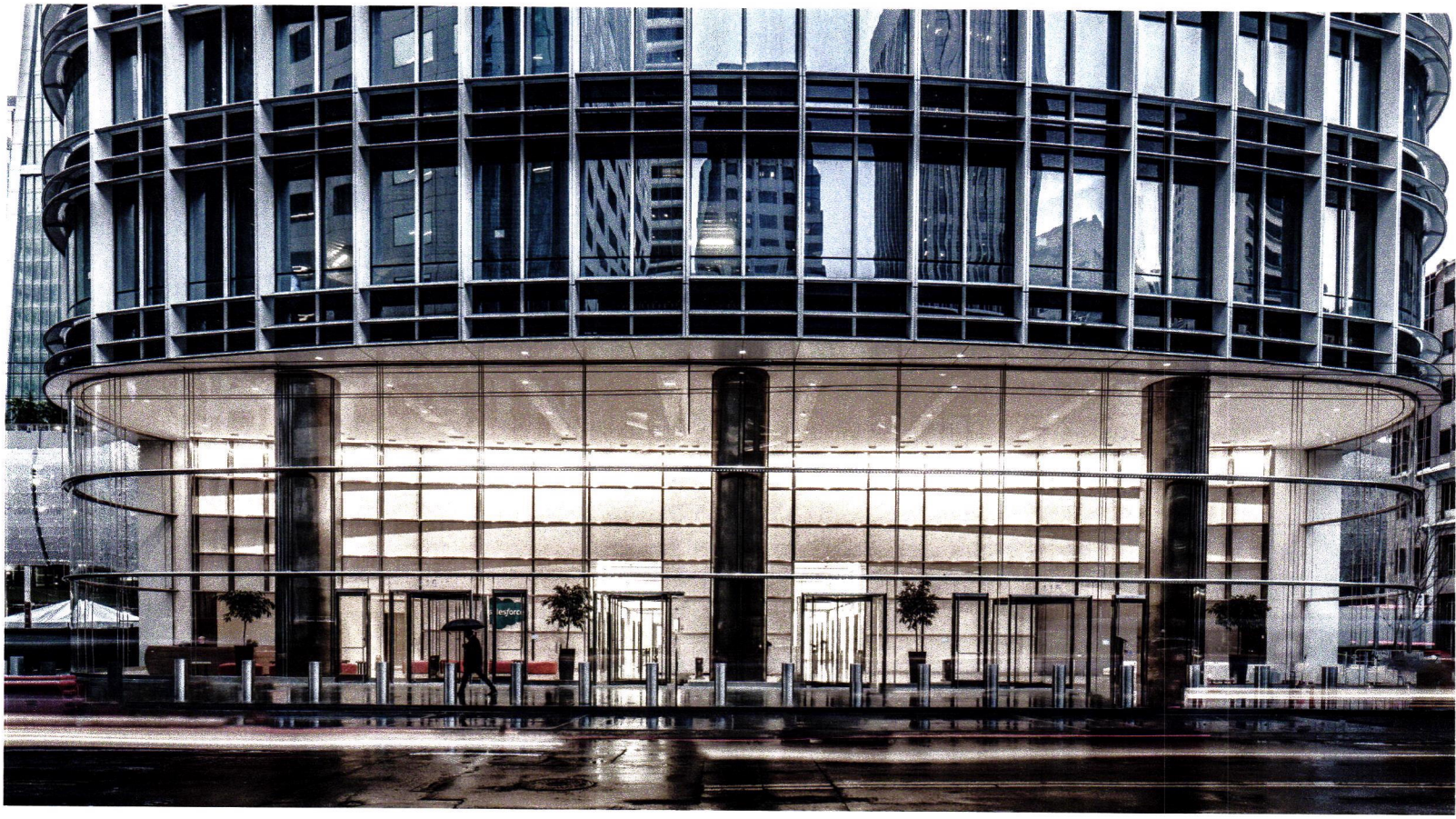


SECTION A - A

0 150 FT.
50 M.

1 SALESFORCE TOWER
2 SALESFORCE TRANSIT-CENTER PARK
3 MAIN LOBBY
4 ANCHOR-TENANT LOBBY
5 RESTAURANT
6 LOADING
7 SALESFORCE TRANSIT-CENTER GRAND HALL
8 GONDOLA TO PARK

PHOTOGRAPHY: COURTESY PELLI CLARKE PELLI ARCHITECTS; © JASON O'REAR (OPPOSITE, TOP); VITTORIA ZUPICICH (OPPOSITE, BOTTOM)

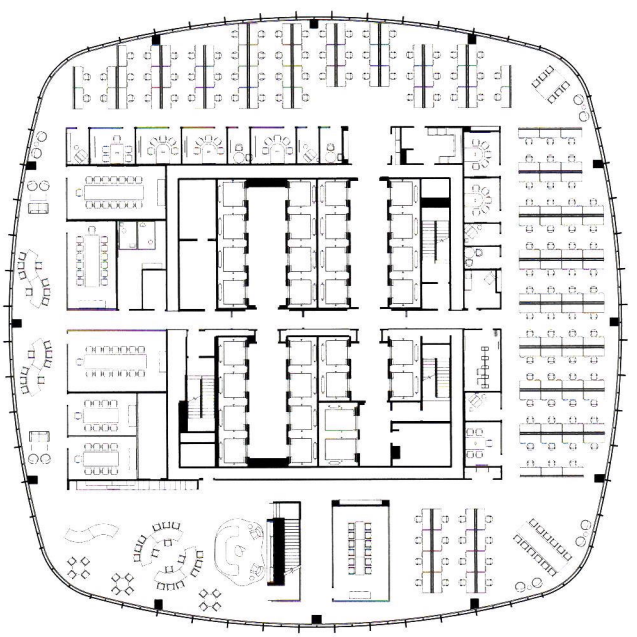


MAKING AN ENTRANCE
At the ground, the highly transparent facade (above and right), supported by a system of horizontal trusses and cable nets, puts the marble-and-chrome lobby on display. Above street level, the building's aluminum sunshade grid (opposite), which sits proud of the skin, adds texture and depth.





LIGHT SHOW The scrim at the tower's pinnacle (opposite) becomes a canvas at night for an LED installation by artist Jim Campbell. The office floors for Salesforce employees (left) are non-hierarchical, without private offices. Spaces for informal collaboration include a loungelike area with sofas and upholstered chairs (above).



TYPICAL SALESFORCE OFFICE FLOOR

0 16 FT. 5 M.

Because PBSD depends on sophisticated computer-modeling techniques, engineers are able to "interrogate and analyze" the structure to determine the response of the building to ground motion and then "fine-tune and allocate strength where it is needed," says Klemencic. Salesforce Tower provides an enhanced level of protection, beyond what is mandated by code for buildings with more than 5,000 occupants.

This advanced engineering will only be tested in an extreme event, of course. But other building systems will have an effect on occupants' day-to-day well-being. Clarke touts the energy-conserving air-conditioning system. It takes advantage of outdoor air and San Francisco's mild climate to provide "free cooling" when conditions are right. In conjunction with raised floor distribution, the system should improve indoor air quality and thermal comfort. It is one of many features that have helped the tower's core and shell garner a LEED Platinum certification.

The Salesforce offices are also on track to earn their own Platinum rating. Mark Cavagnero Associates (MCA), working with Interior Architects, has designed the Salesforce floors, creating a non-hierarchical environment intended to encourage teamwork. The scheme includes "neighborhoods," each comprising three floors connected with a communicating stair. Instead of private offices, the workplace has unassigned, open desks. In addition to conference rooms enclosed almost entirely in glass, there are spaces for less formal collaboration and socializing, including a kitchenette and a loungelike area with sofas and upholstered chairs. These more relaxed spaces occupy the prime part of each floor plate—the side that overlooks the park atop the transit center. "Marc



PHOTOGRAPHY: © TIM GRIFFITH; COURTESY SALESFORCE (OPPOSITE)

wanted the best views and best light to be shared," says MCA's founding partner, Mark Cavagnero, referring to Salesforce CEO Marc Benioff.

Benioff's workplace-as-community philosophy extends to the building's top floor, which has dramatic views of the Golden Gate Bridge, Coit Tower, and the piers along the Embarcadero. There Cavagnero is creating a gathering and event space with a large kitchen and a café, rather than executive offices, as one might expect. The facility is envisioned as a "living room" of which customers, employees, their families, and even the public could take advantage.

This floor is still under construction, so it is too soon to know just how accessible this space will be to non-Salesforce employees. But in many respects, the tower is already proving a success. Its leasing is virtually complete—with tenants that include coworking giant WeWork, consulting firm Accenture, and real-estate brokerage CBRE—but its impact is even further-reaching. The tower has refocused the energy of downtown with a sophisticated new skyline topper emblematic of the future. ■

credits

ARCHITECT: Pelli Clarke Pelli – Cesar Pelli, Fred Clarke, Edward Dionne, Chris Herring, Ileana Dumitriu, project team

ARCHITECT OF RECORD: Kendall-Heaton Associates

CONSULTANTS: Magnusson Klemencic Associates (structural); WSP Group (m/e/p); BKF Engineers (civil); Arup (geotechnical); Morrison Hershfield (curtain wall); Stok (environmental); HLB Lighting Design (lighting); PWP Landscape Architecture, RHAA (landscape)

GENERAL CONTRACTOR: Clark Hathaway Dinwiddie Joint Venture

CLIENT: Boston Properties, Inc., Hines Interests Limited Partnership

SIZE: 1.4 million square feet

COST: withheld

COMPLETION DATE: May 2018

SOURCES

CURTAIN WALL: besnon Industries

GLAZING: Guardian Industries

LOBBY STONE: Campolonghi

LIGHTING: Lithonia Lighting, LaMar Lighting, Luna, Birchwood, Gotham, Selux, Lumenpulse, Boca Flasher, Lucifer, Elliptipar, USAI, AION LED, Finelite, AXIS



PHOTOGRAPHY: © LAURIAN GHINITOIU

Shenzhen International Energy Mansion | China | Bjarke Ingels Group

Pleats Please

A folded curtain wall on an office building saves energy while throwing a few curves.

BY CLIFFORD A. PEARSON

For much of the industrial age, factory roofs with sawtooth clerestories brought steady north daylight into spaces where workers toiled at assembly lines and production tables. For today's office workers, the Bjarke Ingels Group (BIG) flipped this model on its side, wrapping the facades of the Shenzhen International Energy Mansion with a zigzagging curtain wall made of alternating panels of glass and powder-coated (PVDF) aluminum. Like its industrial predecessor, the 21st-century wall system blocks a great deal of direct sunlight, reducing solar loads by 30 percent, according to the architects. BIG then took the concept one step further, pulling on the vertical folds in certain places, so they form supple curves that animate the elevations in surprising ways.

Located in Shenzhen's central business district, not far from the Futian border crossing with Hong Kong, the 1 million-square-foot complex contains a pair of office towers and a nine-story connecting block with shared facilities such as a cafeteria, conference spaces, and retail. The top 13 floors of the 42-story north tower serve as the headquarters for the Shenzhen Energy Company; the rest of that building and all of the 19-story south tower will be leased to other tenants. While the Energy Mansion is surrounded by much taller buildings, including KPF's 115-story Ping An International Finance Center, completed in 2017, it uses its curvaceous lines to stand out in the crowd.

BIG won the project in an invited competition in 2009 just as it was designing the Danish Pavilion at the 2010 World Expo in Shanghai. The theme for that Expo was "Better City, Better Life," and the firm explored notions of "hedonistic sustainability" for its pavilion, says Bjarke Ingels, the firm's founding partner. Many of those ideas, such as making green design beautiful and visually pleasurable, informed his work



PUSHING THE ENVELOPE On the west facade of the 42-story tower (opposite), a bulging slit brings in extra daylight to conference rooms inside. The 19-story tower sits on the south end of the site (above).





SCULPTED MASS The architects sliced away some of the corners, eliminating the sawtooth facade there and introducing subtle curves to the rest of the building envelope (opposite). The two towers stand out without screaming for attention (above).

on the Energy Mansion too, as he tried to adapt modern architecture to the subtropical climate of Shenzhen. Updating the wisdom of vernacular design and collaborating with the firm Transsolar on sustainability issues, Ingels wondered if he and his team could develop "engineering without engines." So they developed passive solar strategies such as using one tower to shade the other and designing a skin that would reduce solar loads and glare without expensive mechanical equipment. "As architects used to do, we put the performance of the building in its bones, not the machines added to it," explains Ingels.

They ended up designing a curtain wall with tall, double-glazed panes of low-E tempered glass angled at 45 degrees in plan, so the clear portions face northwest on the west side of the building and northeast on the east side—always blocking out the stronger southeast and southwest sun with the rippled aluminum panels. Originally, the architects hoped to use solar-thermal panels that would power air-conditioning and dehumidification, but that proved too expensive.

After they established their design, the architects learned that Eero Saarinen had used a similar sawtooth curtain wall for his Laird Bell Law Quadrangle at the University of Chicago in 1959, a discovery that pleased them, says Ingels: "I've always admired Saarinen." More recently, SOM designed a zigzagging glass envelope for its United States Courthouse in downtown Los Angeles (RECORD, March 2017).

The other ingenious aspect of the Energy Mansion is the way its folded facades get twisted into pleats at critical places—such as pedestrian entries at the northeast and southwest corners—and pulled out into a bulging slit on the upper portion of the west facade of the taller tower. These moves result in a graceful dynamism that becomes more apparent the closer you get. "We were inspired by the way Issey Miyake uses pleats in his clothes," says Ingels.

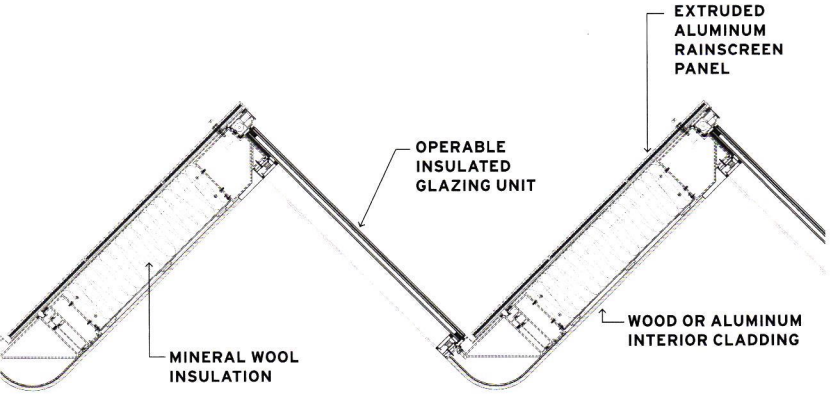
Visitors arriving by car enter the steel-frame building at the low connecting block between the two towers, where a three-story lobby features white marble floors and walls clad in anodized aluminum and black stainless steel. Bamboo veneer on the angled fins of the building's sawtooth perimeter and a cascading sheet of water on one wall add touches of nature to the interior. On the energy company's office floors, low cubicles occupy the areas in the middle, while casual tables

PHOTOGRAPHY: © CHAOS ZHANG (OPPOSITE); LAURIAN GHINITOIU

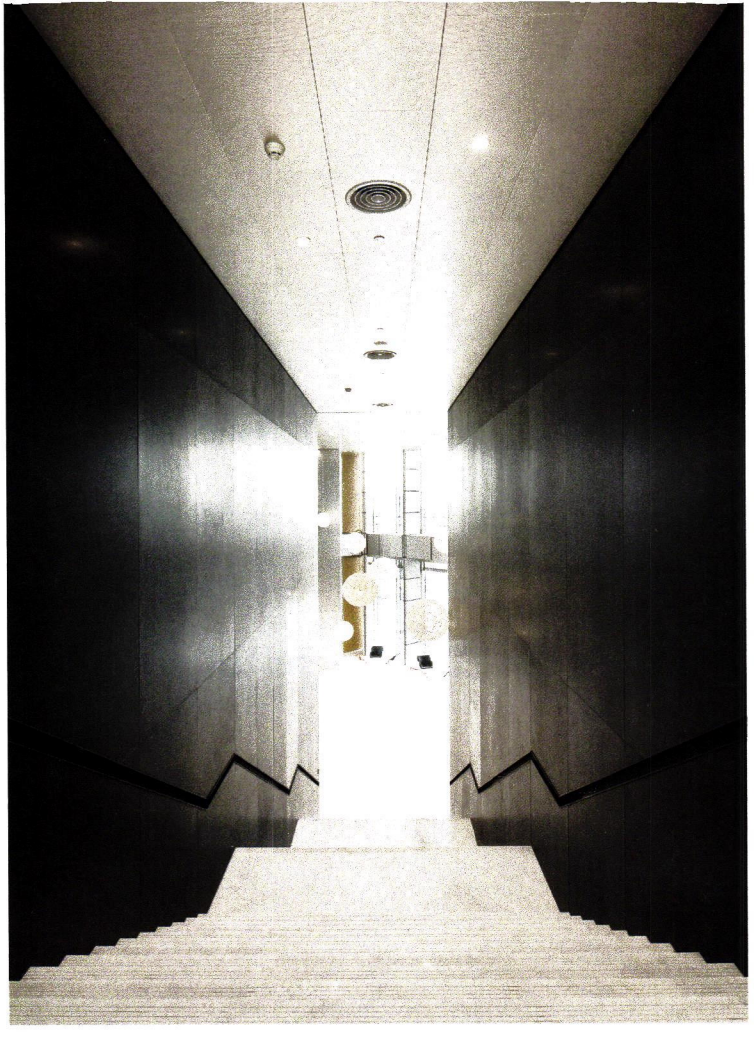


SOUTH TOWER LEVEL-19 PLAN

1 ELEVATOR LOBBY
2 OPEN OFFICE
3 PRIVATE OFFICE
4 MEETING
5 RESTROOM
6 MECHANICAL



TYPICAL DETAIL AT OPERABLE WINDOW



and chairs fill in the spaces along the curtain wall. The company is still trying to figure out how to use the extra space on floors where the building bulges out. Currently these areas are furnished sparsely with random chairs, while adjacent meeting rooms face them to take advantage of daylight coming in from the vertical slit.

Due to a strict zoning envelope and a tight budget, "we focused our efforts on what we had the most control over—the facades," says Ingels. These elevations, with their pleated wrapping, perform double duty—giving the project its distinctive identity and showing how sustainability can be sexy. ■

Clifford Pearson was an editor at ARCHITECTURAL RECORD *for over 25 years. Now with the University of Southern California, he serves as a contributing editor at the magazine.*

credits

ARCHITECT: Bjarke Ingels Group (BIG) – Bjarke Ingels, Andreas Klok Pedersen, partners in charge; Martin Voelkle, project manager; Andre Schmidt, Song He, project leaders; Cat Huang, concept project leader
ASSOCIATE ARCHITECTS: SADI Shenzhen Architecture and Design Institute
INTERIOR DESIGNERS: BIG, SADI
ENGINEER: Arup
GENERAL CONTRACTOR: CSCEC
CLIENT: Shenzhen Energy Company
SIZE: 1 million square feet
COST: withheld
COMPLETION DATE: June 2018

SOURCES

METAL PANELS: Xiangfa Aluminum
OPERABLE WINDOWS: Aumüller
GLASS: SYP Group
ENTRANCES: Dorma
ACOUSTICAL CEILINGS: Armstrong
CARPET: Haima Carpet
ELEVATORS/ESCALATORS: Kone

PHOTOGRAPHY: © CHAOS ZHANG (3)





MATERIAL MATTERS
For the public interiors, BIG used a palette of natural and industrial surfaces, including black stainless steel (opposite), bamboo veneer (above), and white marble flooring (left).

EY Centre | Sydney | fjmt

A Dash of Local Color

An unusual golden skin makes a tower stand out amid a forest of anonymous high-rises.

BY JEREMY HANSON

Sydney's central business district is studded with skyscrapers by international architecture firms, including Renzo Piano Building Workshop's Aurora Place (2000), Foster + Partners' Deutsche Bank Place (2005), and Rogers Stirk Harbour + Partners' 8 Chifley (2013). The work of these big guns from abroad is so pervasive that it's almost unusual to see a high-rise development led by Australian architects.

Not far from Sydney Cove, the compact bay that connects Jørn Utzon's Opera House and the Harbour Bridge, a new building by Sydney-based fjmt has been designed to show the strength of going local, not global. Fjmt's design director, Richard Francis-Jones—whose studio won the World Architecture Festival's World Building of the Year in 2013 for its work on the Auckland Art Gallery—predicated his firm's competition-winning scheme on demonstrating a rich Australian sense of place, a counterpoint to the bland globalized homogeneity of glass-and-steel office towers. The EY Centre isn't the tallest building in the district—its height was limited by a requirement for sunlight access for a nearby square. But in a downtown dominated by high-rise buildings of cool gray stone and dark glass, fjmt's 37-floor, 509-foot-tall building is a surprising shot of warmth: a curvaceous, organic form lined top-to-bottom with timber blinds that glow golden in the bright Australian sunlight from behind a single pane of clear, low-iron glass.

The EY Centre's sleek assembly of two intersecting vertical and rectangular volumes, with curved edges and a four-story podium, occupies a site on George Street, one of the city's most important boulevards. It features a brass strip that runs across the ground floor and a new plaza to mark the 1780 shoreline of Sydney Harbour. The indigenous Gadigal clan and Australia's first colonial settlers used the now-buried Tank Stream that once ran beside the site as a freshwater source; the shoreline was fringed with eucalyptus trees, the inspiration

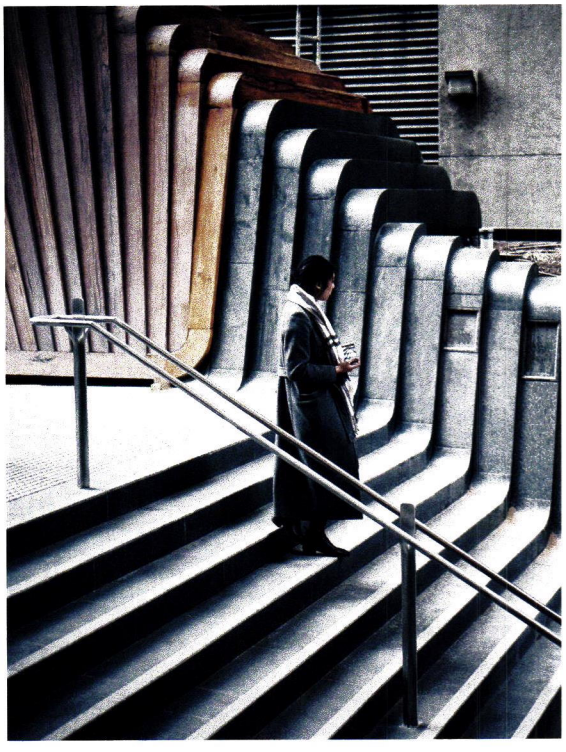




ALL AGLOW Sydney's EY Centre by fjmt features an Australian first: a cavity curtain wall system enclosing timber blinds. These shade the interior and take on a golden glow in the sun, making the building stand out from its neighbors.

PHOTOGRAPHY: © MARK MERTON (OPPOSITE); RODRIGO VARGAS







CURB APPEAL The podium peels away to create two courtyards linked by stairs and a curvaceous kiosk (above and bottom), while steel-and-concrete V-columns (left) support the tower overhead. In the lobby (opposite), a work by indigenous artist Judy Watson is incised on sandstone quarried from the site. The chairs are by Australian designer Brodie Neill.

behind the marine ply panels on the podium's vertical fins, street awning, and lobby ceiling.

Francis-Jones was determined that the building would look and feel distinctive, and that it would be a good citizen of the city. "Towers usually just crush their sites through sheer scale," he says. Instead of gobbling its site at ground level, the EY Centre's podium peels away to create the new plaza. From there, steps emulating the original contour of the land lead down to an intimate courtyard with a slim, curvaceous kiosk and a series of laneways previously inaccessible from this part of George Street. Elegant white steel-and-concrete V-columns support the part of the tower that overhangs the plaza, providing shade from the scorching summer sun.

Visitors to Sydney will be familiar with the honeyed hues of the sandstone, known as Yellow Block, used in the construction of many of the city's stately Victorian buildings. At the EY Centre, sandstone was quarried from the site during excavation and now clads the elevator core, creating the impression that the building's reinforced-concrete structure has actually been fashioned from the stone below. In the lobby, this sandstone is the basis of a dramatic 3,200-square-foot artwork by



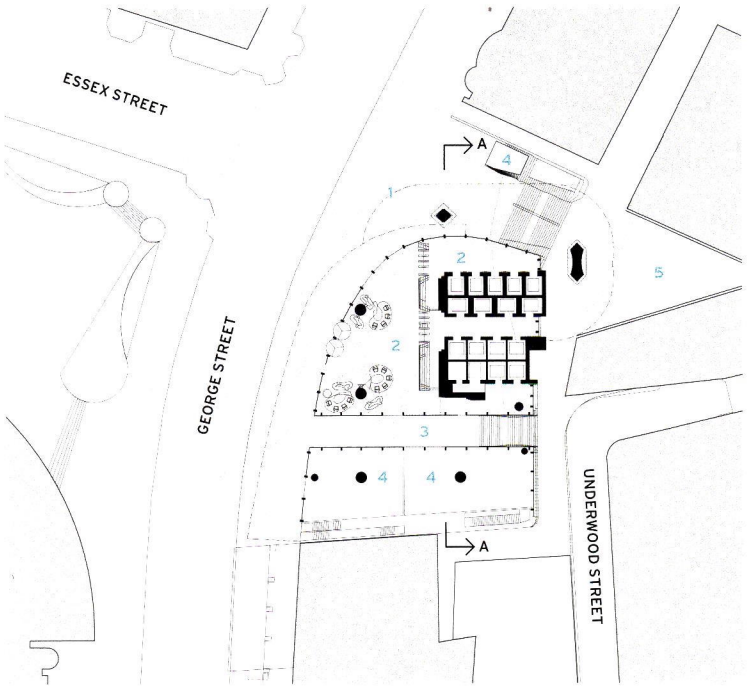
indigenous artist Judy Watson. Other buildings on George Street have grand artworks in their lobbies by Sol LeWitt and Frank Stella; it seems fitting that this building, in its aspirations to create a truly Australian sense of place, puts an indigenous Australian woman artist on an equal footing with these American men.

For all this generosity at ground level, it is what happens upstairs that is the building's real talking point. Some people who have not been inside have asked why anyone would cover the spectacular view of the Sydney Harbour Bridge and Opera House with blinds, but the blinds are controlled by an algorithm and are only closed for part of the day. When the sun is shining from the west, the blinds to the east and south are usually open, so that there is always a vista of somewhere (the building's offset core means that even the bathrooms have windows with views). When the blinds are closed, plenty of daylight still gets in, and the occupants see the timber screen suffused with a golden glow.

The closed-cavity facade and timber blind system is an Australian first that required extensive research and development. The exterior of the building is comprised of a single sheet of clear low-iron glass in front of a sealed, dust-free pressurized cavity containing the timber blinds (the cavity's edges are also lined with wood). Behind this is a layer of double-glazed high-performing insulated glass. The cavity containing the blinds heats up in the summer sun, but excess heat is emitted straight back through the single exterior pane, and the double-glazed pane is never in direct sunlight.

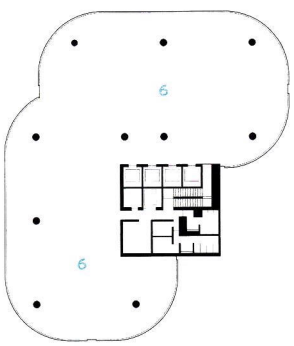
The facade system has a solar heat gain coefficient of 0.11, making its thermal performance 35 percent better than that of a more

PHOTOGRAPHY: © BRETT BOARDMAN, EXCEPT AS NOTED; JOHN GOLLING (OPPOSITE, BOTTOM)



PUBLIC-DOMAIN PLAN



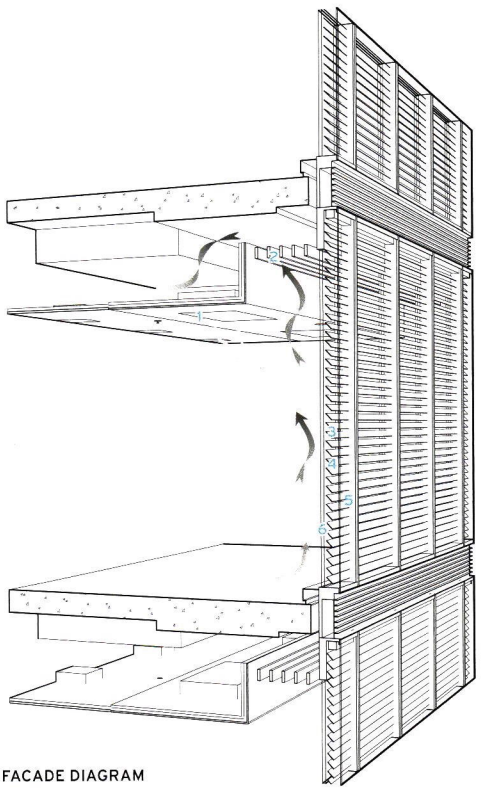


TYPICAL UPPER-FLOOR PLAN

1 CRANE PLAZA
2 LOBBY
3 THROUGH-SITE LINK
4 RETAIL
5 POCKET PARK
6 OFFICE SPACE
7 ROOF TERRACE
8 MECHANICAL SPACE
9 PARKING

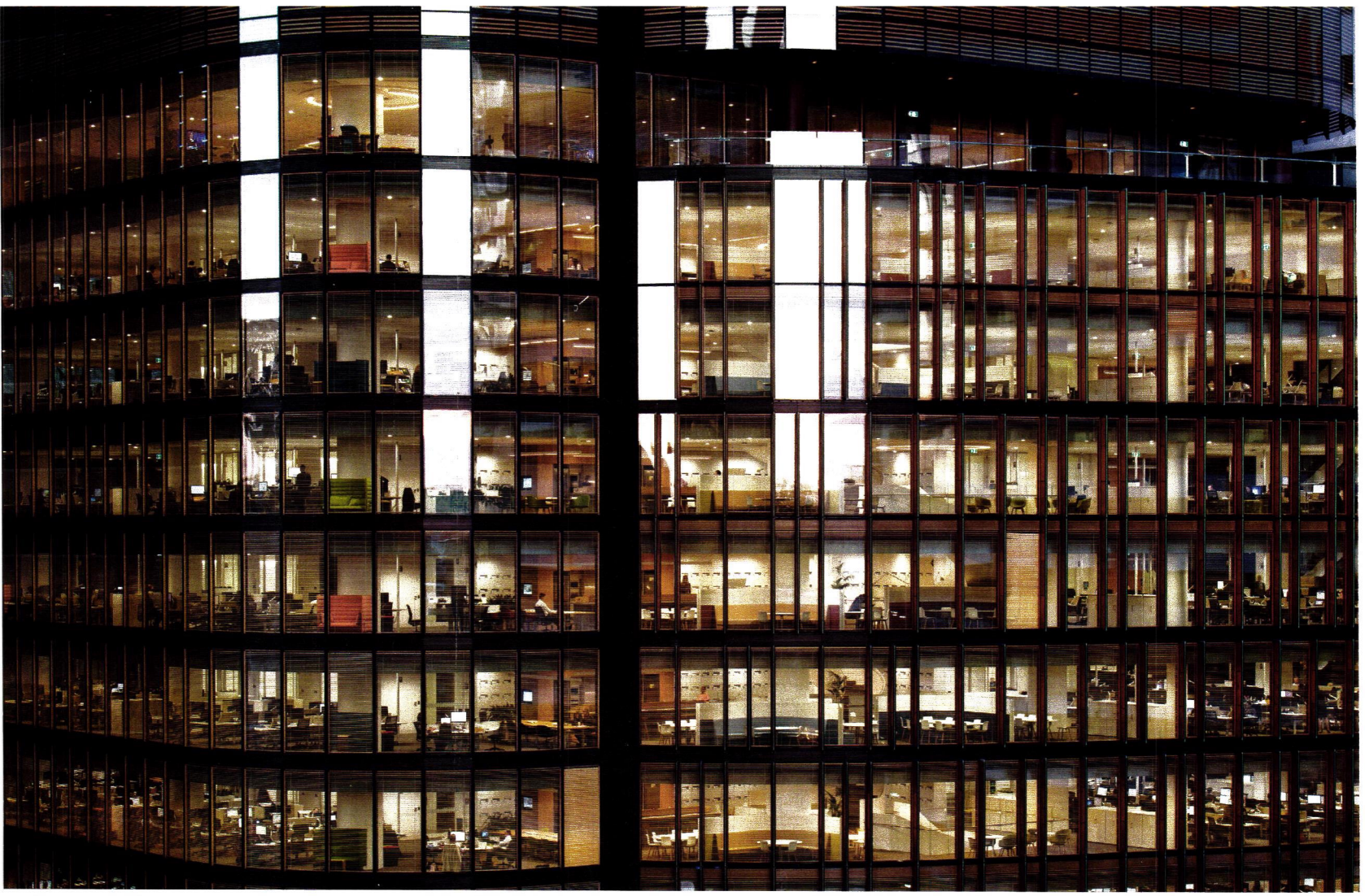


SECTION A - A



FACADE DIAGRAM

1 PERIMETER ACTIVE CHILLED BEAM
2 PERIMETER CEILING BATTENS
3 TIMBER VENETIAN BLINDS
4 PRESSURIZED CAVITY
5 INTERNAL INSULATED-GLASS UNIT
6 SINGLE-LEAF EXTERIOR GLAZING



OPEN AND SHUT
The timber blinds are controlled by an algorithm and are fully open later in the day (above). When the blinds are closed, the interiors are suffused with a warm light (right). The use of wood also extends to the exterior, including the soffit (opposite) where the tower extends beyond the podium.





WOOD WORKS The building's awning features an intricate arrangement of marine-grade plywood, while vertical fins clad in timber project from the four-story podium.

standard curtain wall assembly. The sophisticated skin works in conjunction with such features as hybrid chilled beams, an all-LED lighting scheme, and an advanced energy-monitoring system to earn the EY Centre six stars under Australia's green building certification program—the highest rating possible.

The building's developer and builder, Mirvac, moved its head office to the EY Centre after completion in 2016 (other occupants include EY, a business consultancy and the primary tenant, and AGL, an electricity and gas company). Since then, Mirvac has been surveying the satisfaction of its employees. Staff have reported a 50 percent increase in their sense of "spatial comfort," a particularly impressive response given that the old headquarters had 129 square feet of space per person; there are only 86 square feet of space per person in the EY Centre. Most gratifying for the architects, the staff's sense of connection to the outdoor environment has increased 41 percent, making it that much harder to mistake the EY Centre for a product of any other place. ■

Jeremy Hansen is an architecture writer based in Auckland, New Zealand.

credits

ARCHITECT: fjmt (Francis-Jones Morehen Thorp) – Richard Francis-Jones, Johnathan Redman, Soenke Dethlefsen, Peter Dawson, Steven Wu, Natalie Fan, Martin Hallen, Pray Mathur, Stephen Pratt, Owen Sharp, Daniel Karamaneas, Richard Desgrand, Richard Tripolone, Chris Roberts-Brewer, Matthew Todd, project team

CONSULTANTS: BG&E (civil, structural); Arup (m/e/p, fire, vertical transport, sustainability); Surface Design (facade); AR-MA (geometry); CPP (wind); GML (heritage); Judy Watson, Michael McIntyre (art); Renzo Tonin & Associates (acoustics); Climatech Group (energy concept)

GENERAL CONTRACTOR: Mirvac Construction

CLIENT: Mirvac Projects

SIZE: 470,000 square feet

COST: withheld

COMPLETION DATE: June 2016

SOURCES

MASONRY: Boral

METAL PANELS: Alucobond

CURTAIN WALL: Permasteelisa

MARINE PLYWOOD: Austral

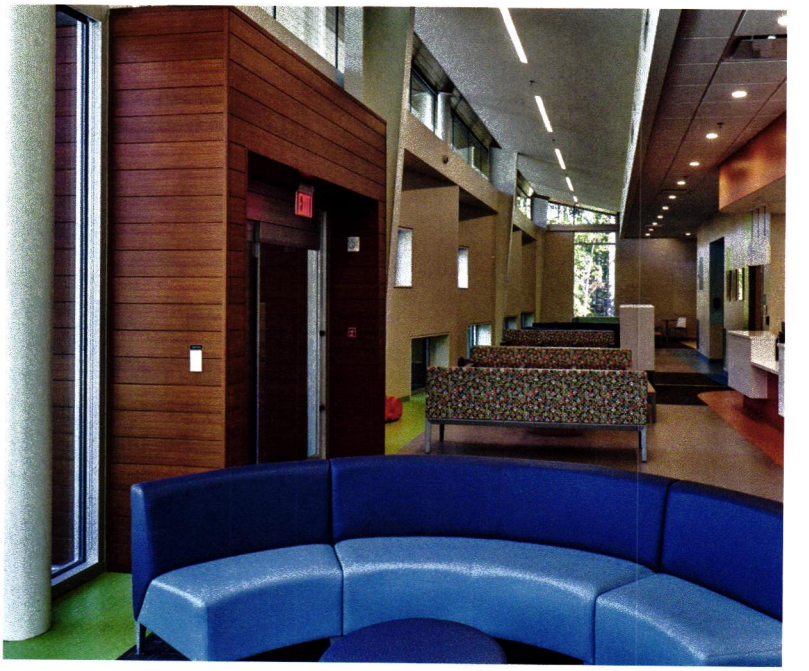
CEILING SUSPENSION GRID: Armstrong

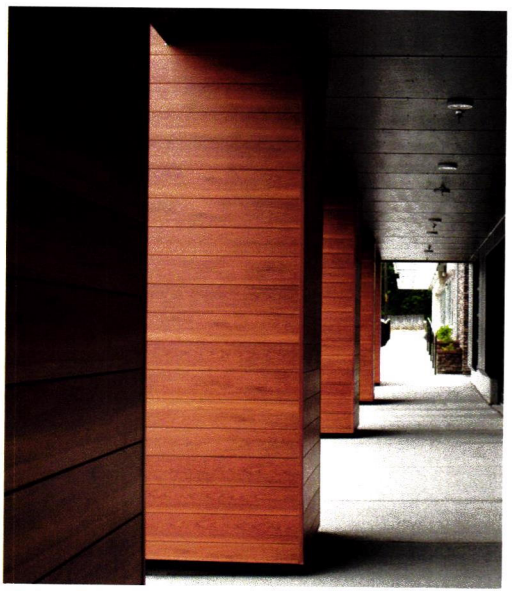
RESILIENT FLOORING: Forbo

CARPET: Interface

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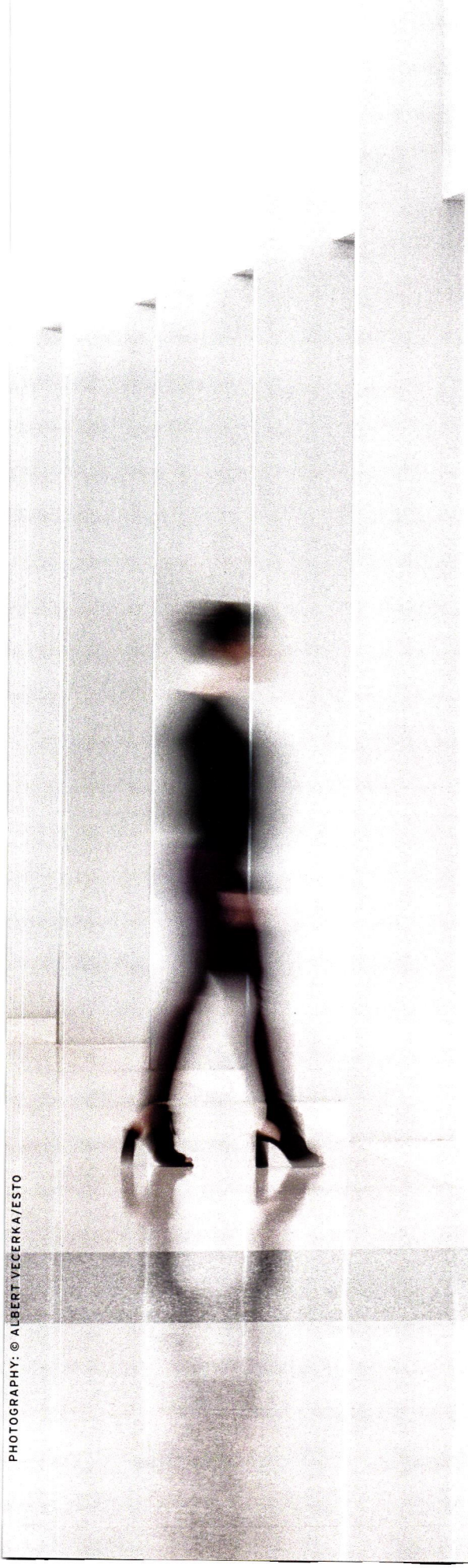
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HEALTH CARE

The following projects span a range of scales, but all show a keen understanding of architecture's powerful impact on well-being. From an HIV/AIDS clinic to a reimagined urban hospital campus, these facilities employ surprising forms and unlikely materials to create state-of-the-art environments that are welcoming to the people they serve.

UNIVERSITY OF TEXAS AT DALLAS
BRAIN PERFORMANCE INSTITUTE BY PAGE

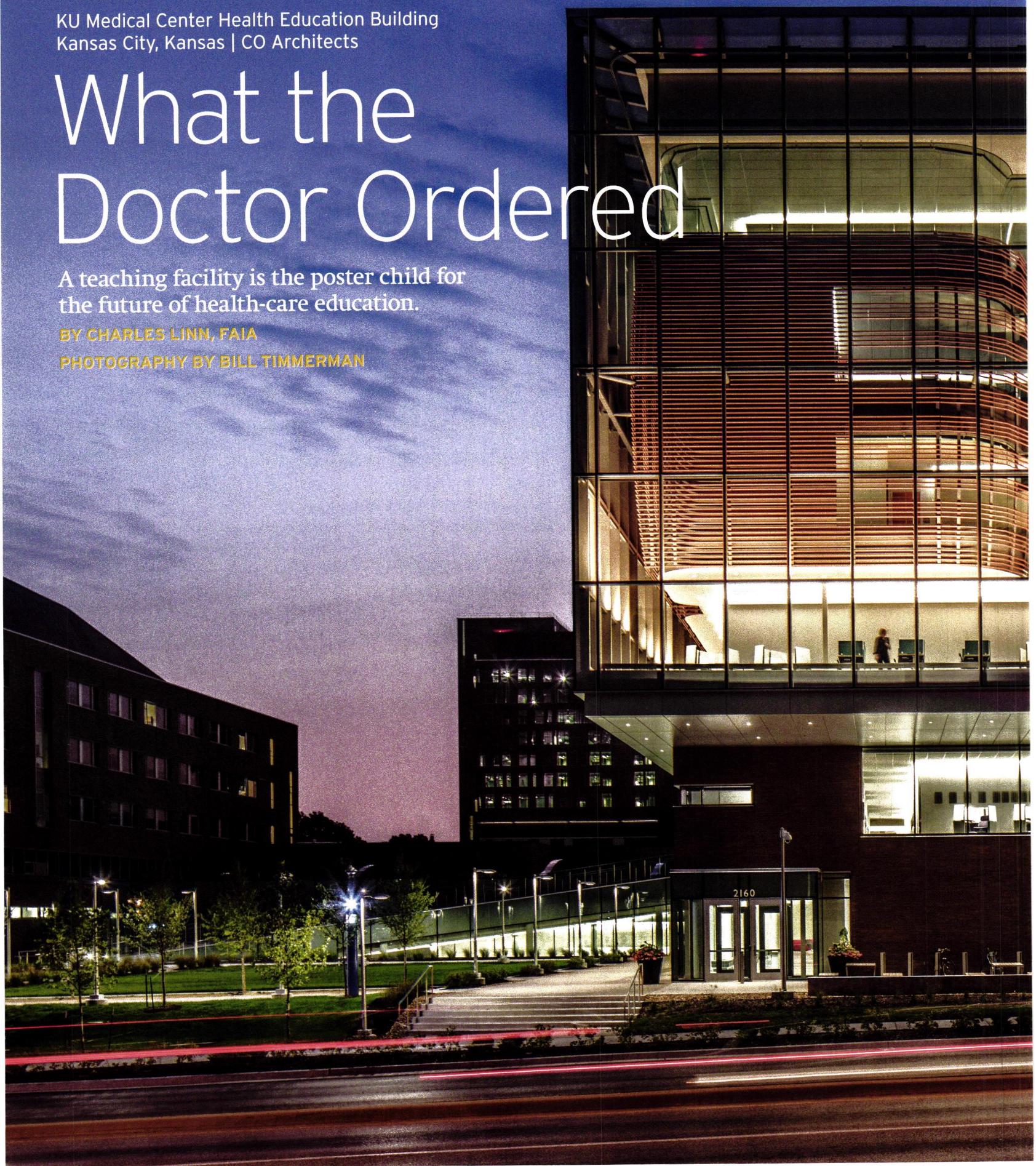
KU Medical Center Health Education Building
Kansas City, Kansas | CO Architects

What the Doctor Ordered

A teaching facility is the poster child for the future of health-care education.

BY CHARLES LINN, FAIA

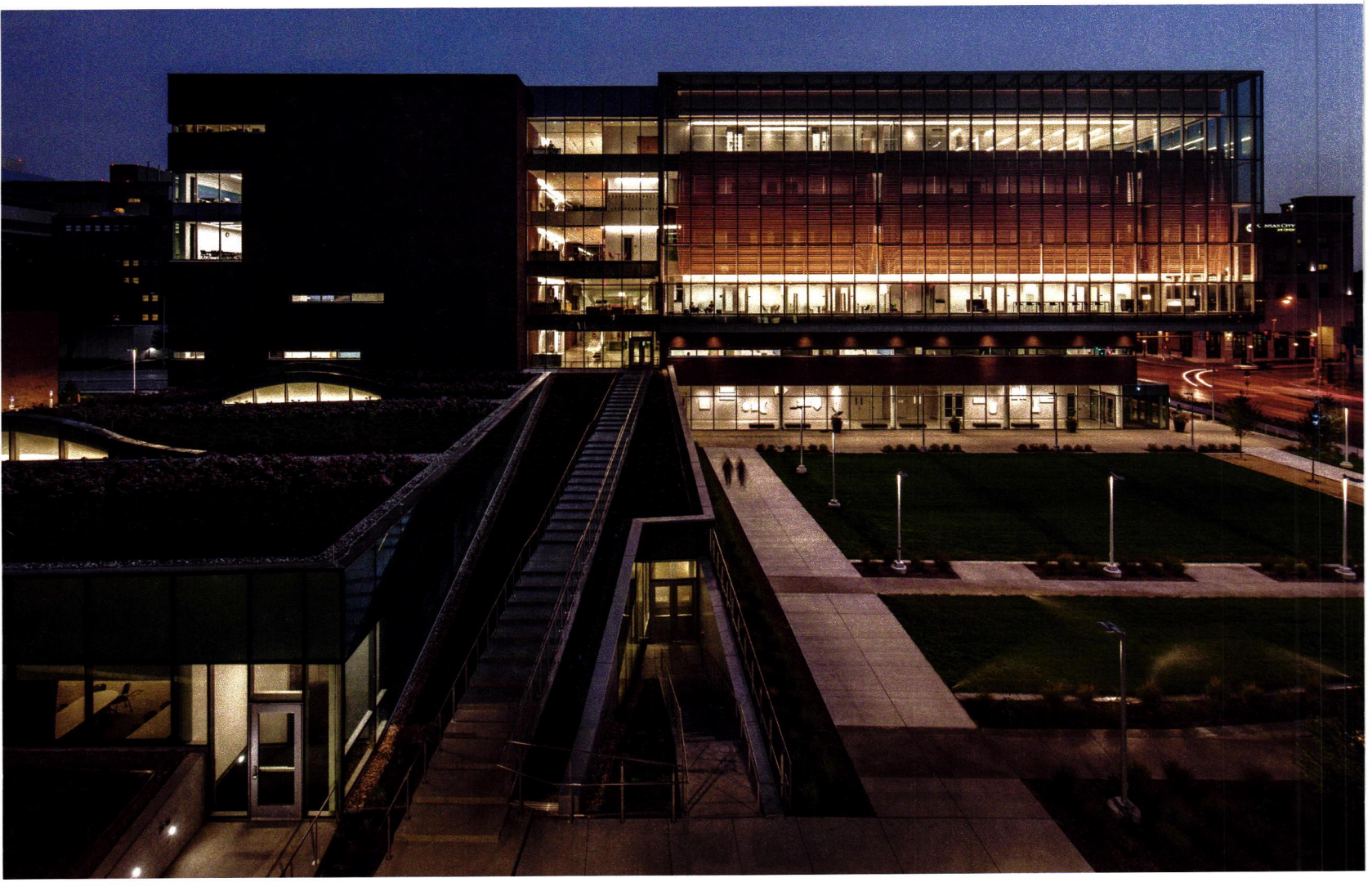
PHOTOGRAPHY BY BILL TIMMERMAN





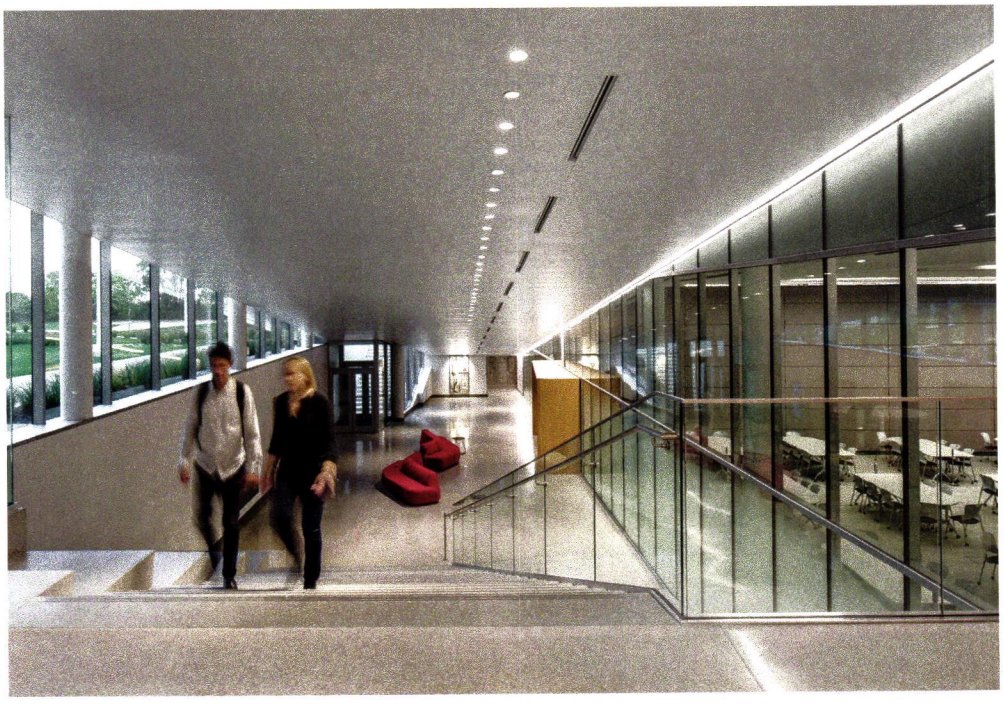
While instruction at the Schools of Medicine, Nursing, and Health Professions at the University of Kansas (KU) long enjoyed a reputation of innovation and excellence, the aging facilities did not. Healthcare education has moved in directions that the designers of KU's six classroom and lab buildings could never have anticipated. With two structures built in the 1930s and a third almost a century old, the university knew that adapting the edifices to meet new standards of health-care education was not an option.

In 2014, the medical school's leadership seized upon the opportunity to design a new facility from the ground up. They chose Los Angeles–based CO Architects, along with executive architects Helix Architecture + Design, to create a center that would allow the school to incorporate simulations training, or "sims," into its curricula in



a major way while making space for a 25 percent increase in enrollment. More broadly, the architects were to create a building that, located on a prominent corner at the gateway to the campus, would make Kansans proud of the outstanding KU Health System.

The result is the 172,000-square-foot, six-story Health Education Building (HEB), oriented on an east–west axis overlooking two major streets. At the front, the top four levels are expressed as a cantilevered volume enclosed within a double-walled glass facade. "KU wanted this building to be a front door, and, at night, a lantern," says Jon Kanda, principal of CO Architects. "Transparency and the use of glass became our modus operandi to achieve those effects." Behind, to the east, the volume contains small learning studios, the mechanical core, and circulation. Here the facades are clad in roman brick and are slashed by strip windows and a masonry screen. An expansive one-story learning-studio wing with a green roof is sunk into the site to the northeast of the glazed volume, and a new



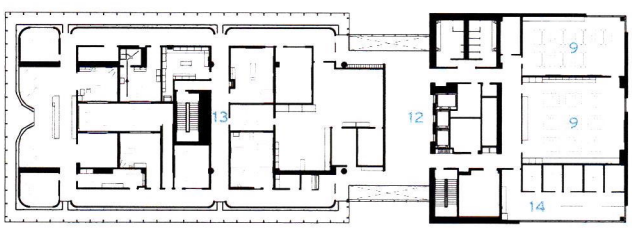
CAMPUS CURE The HEB dramatizes the entry point into the KU Medical Center (opposite, top); simulation suites and other spaces occupy the glass-and-brick volume, while large learning studios (right) are contained within the low-slung portion of the building, beneath the green roof. Students and faculty enter the studios through daylit gathering spaces (opposite, bottom).

glass-enclosed bridge connects the new building to the north with the existing buildings of the medical campus to the south.

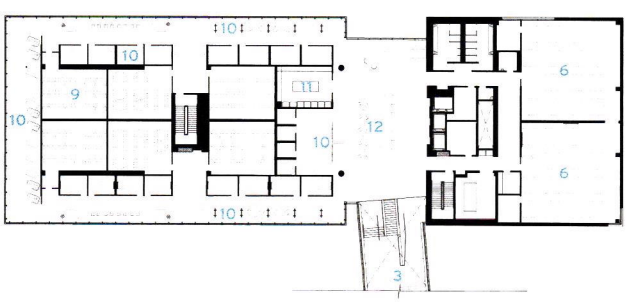
Behind the glass front facade is a gently curving, two-story horizontal screen composed of terra-cotta rods or "baguettes," intended to evoke biology or anatomy. "People sometimes react to the wall as a transparent skin, seeing the baguettes as ribs, bones, lungs, or some sort of thoracic cavity," says Helix principal Brian Gross. "Our intent was not to make it too literal: everyone comes up with their own interpretation of its meaning." John Gaunt, former dean of KU's School of Architecture, Design & Planning, who acted as a design consultant for the university, describes the effect of the scheme this way: "The soaring space between the transparent enclosure and the functional 'box' within is flooded with light, creating architectural delight without compromising a sense of institutional purpose."

Functionally, the terra-cotta screen modulates Kansas's harsh climate and intense sun while providing privacy on the third and fourth floors, where students from all three schools work together on sims,

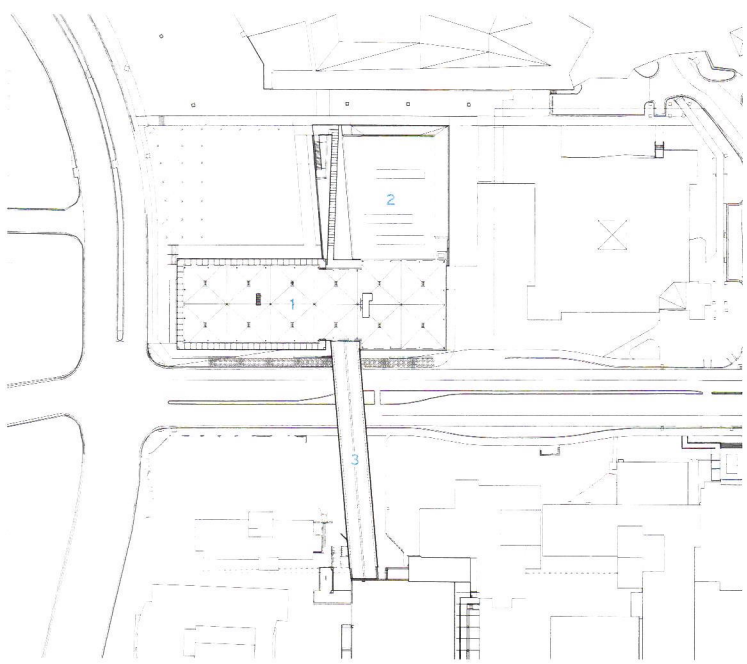




LEVEL-FOUR PLAN

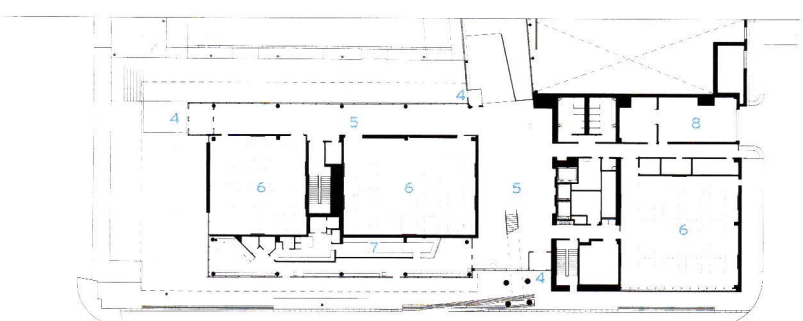


LEVEL-TWO PLAN



SITE PLAN

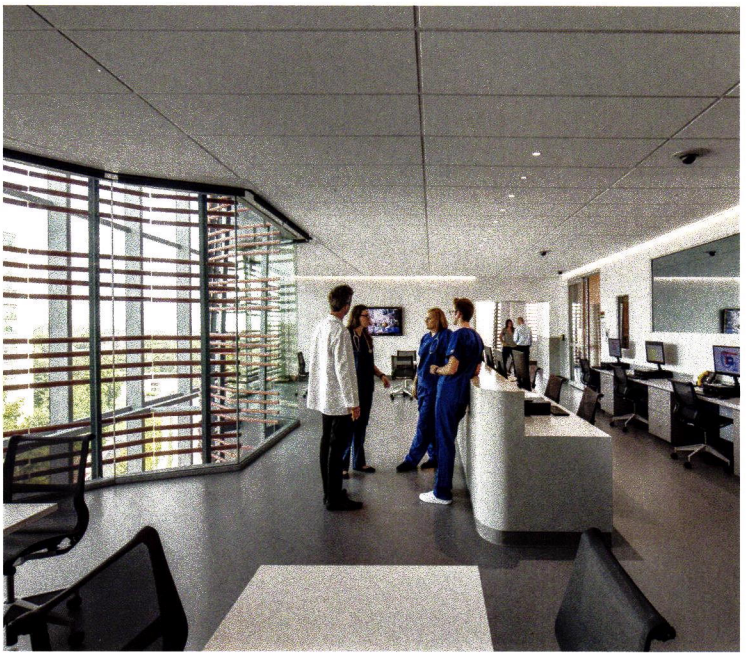
0 50 FT.
15 M.



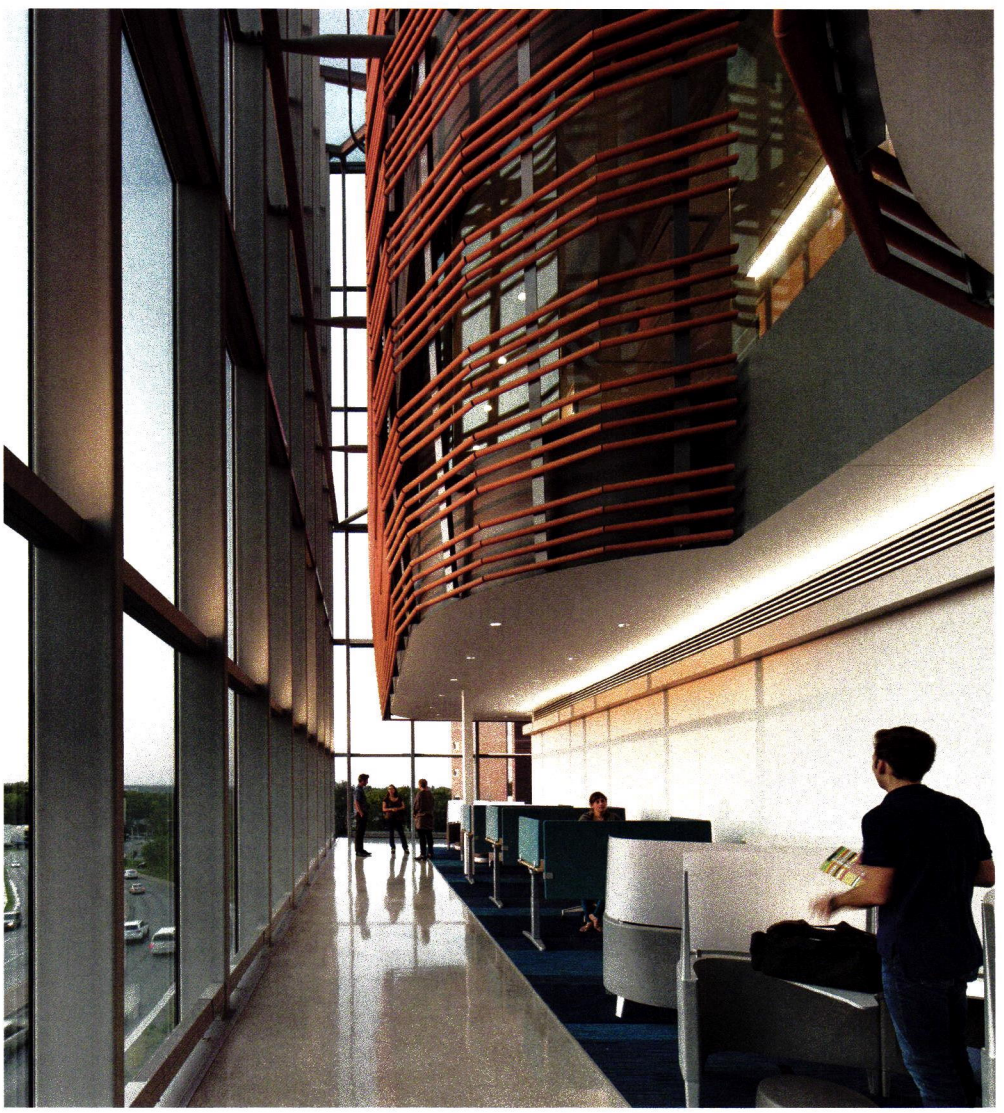
GROUND-LEVEL PLAN

0 30 FT.
10 M.

1 MAIN GLASS-AND-BRICK VOLUME
2 GREEN-ROOF VOLUME WITH LEARNING STUDIOS
3 BRIDGE
4 ENTRANCE
5 LOBBY
6 LEARNING STUDIO
7 RETAIL
8 LOADING DOCK
9 CLASSROOM
10 STUDY SPACE
11 BREAK ROOM
12 STUDENT LIFE
13 SIMULATION SUITE
14 FACULTY OFFICES







TRAINING GROUND Mirrored windows into simulation rooms allow instructors to observe students during hands-on training exercises (above, left and right). Carrels occupy the space below the terra-cotta baguettes (left). A glass-enclosed pedestrian bridge is also used for group study (opposite).

practicing procedures in rooms resembling those they'll someday use. The burgeoning professionals train with some 130 "standardized patients"—actors trained to exhibit specific symptoms according to what is being taught. For some sims, high-tech mannequins are wired to "speak" from control rooms where instructors observe the students working through one-way mirrors. The wide variety of spaces, including emergency rooms, an ICU, a fully equipped operating room, and a nurses' station allow cross-disciplinary teams to work through myriad scenarios.

Dr. Robert Simari, executive vice chancellor of the KU Medical Center, notes that the schools' curricula require medical, nursing, and allied health professionals to do sims together, so that they learn to focus on patient care and safety, engage in collaborative problem-solving, and develop decision-making skills. "We are one of the few programs that merged those silos into a hospital-based environment that's part of the curriculum in all three schools," he says.

The architects' design responded to other new shifts in thinking about medical education as well. Dozens of study rooms for groups of four to 10 replace most single-student carrels, since group learning has been found to be more effective than solo study. Instead of stepped lecture halls, learning "studios" of various sizes allow instructors to stand in the



midst of students, with presentations projected on each wall. At 11,000 square feet, the largest of these is located in a part of the building that could almost be considered a separate structure. Built at grade beneath the green roof, the column-free room can be divided in half or combined for events.

The wide, glass-enclosed pedestrian bridge directing foot traffic through the HEB spans 250 feet and has the feel of a village street. One side is used for circulation, and the other is divided into informal living room–like areas, some open and others enclosed. The passageway allows students and staff to have spontaneous meetings or a quiet coffee while escaping from the pressures of their work.

The university's focus on providing students with the highest-caliber learning facilities ultimately benefits a group of people unlikely ever to set foot in the new HEB: the future patients of the KU-trained doctors, nurses, and other health professionals. "This building is really on the leading edge of medical education," says Simari, "and, in the end, it all comes down to patient care." ■

Charles Linn, FAIA, is a Lawrence, Kansas–based writer and architect and a former deputy editor of Architectural Record.

credits

ARCHITECT: CO Architects – Scott Kelsey, managing principal/principal in charge; Paul Zajfen, design principal; Jonathan Kanda, principal for medical education and simulation; Tanner Clapham, associate/project architect; Chao Chen, architect; Michael Ly, designer

ARCHITECT OF RECORD: Helix Architecture + Design – Bryan Gross, principal in charge; Alissa Wehmueller, interior design principal; Mark Neibling, Sam Loring, architects; Kate Phillips, interior designer

ENGINEERS: Henderson Engineers (m/e/p); Bob D. Campbell and Company (structural); SK Design Group (civil)

GENERAL CONTRACTOR: McCownGordon Construction

CLIENT: University of Kansas Medical Center

SIZE: 172,000 square feet

PROJECT COST: $79 million

CONSTRUCTION COST: $63 million

COMPLETION DATE: July 2017

SOURCES

METAL CLADDING: Reynobond

CURTAIN WALL: Kawneer

CERAMIC BAGUETTES: NBK Architectural Terracotta

GLASS: Vitro Architectural Glass

ACOUSTICAL CEILINGS: Armstrong

DEMOUNTABLE PARTITIONS: Steelcase

PAINTS AND STAINS: Sherwin-Williams

University of Texas at Dallas Brain Performance Institute | Dallas | Page

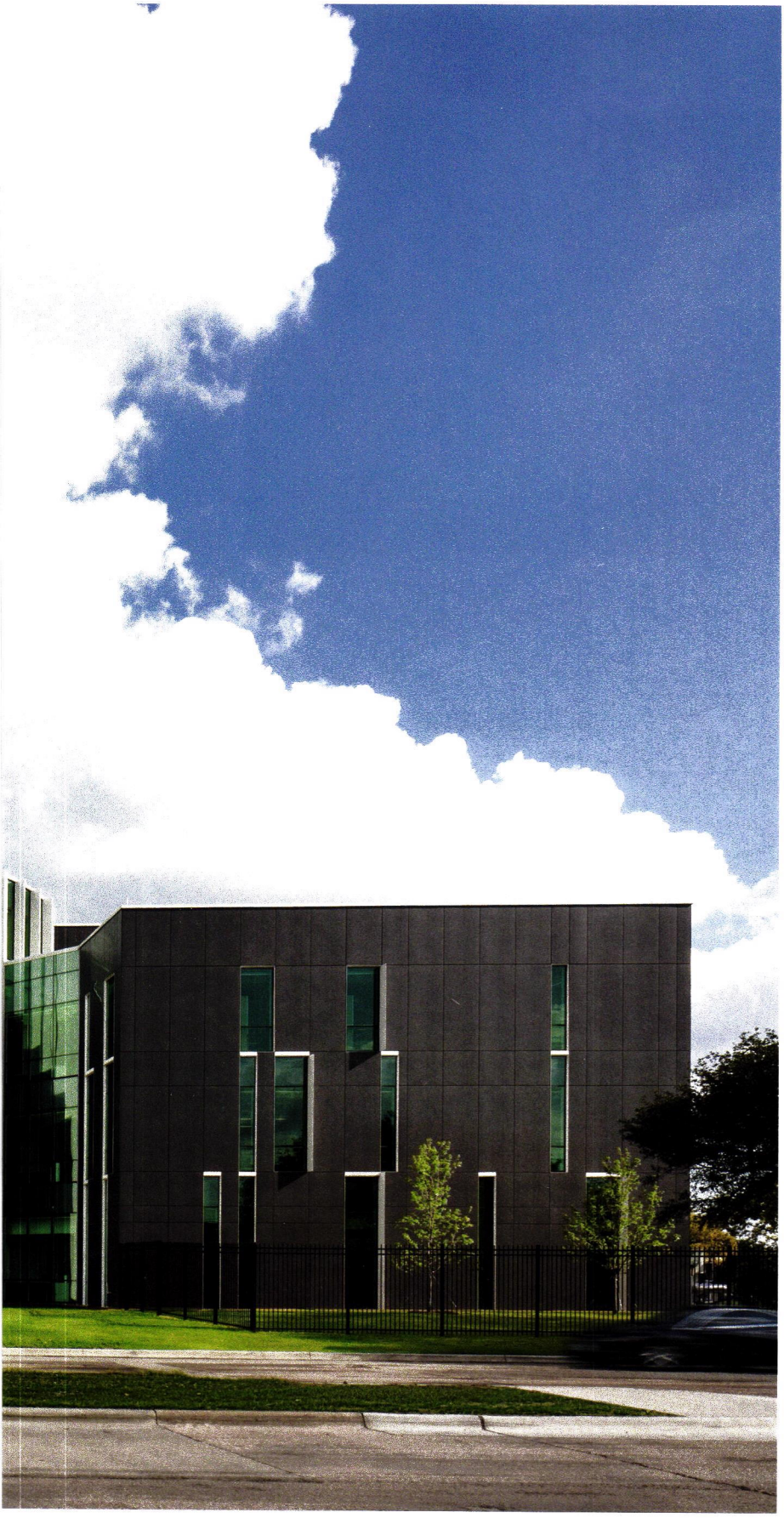
Head Space

In its services and its design, a multidisciplinary brain-health center implements the findings of the latest scientific research.

BY MARK LAMSTER

PHOTOGRAPHY BY ALBERT VECERKA/ESTO





How is our brain changed by the space we work in? What does that space do to make us thrive? These are questions that animate Sandi Chapman, Ph.D., the founding director of the Center for Brain Health (part of the University of Texas at Dallas). Her inquiries are not just academic; at the Center's new Brain Performance Institute—where clinicians and therapists work to improve brain function in healthy people through preventive care, and treat brain-based conditions and disorders including dementia, PTSD, and ADHD—she has translated the ideas generated by these queries into the three dimensions of building.

"A lot of clients don't 'get' architecture," says Lawrence Speck, the design principal for Page, architects of the 60,000-square-foot, $29-million facility. "She gets it. She sees architecture as a tool." One of Chapman's core principles is that there should be variation and surprise in architectural spaces. "This idea of a nimble environment is very good for the brain," she says, indicating the need for movement between spaces. "We wanted each room to have a different feeling when you go into it, so you have a sense of unexpectedness."

Chapman's imperative for architectural diversity is manifest in the form of the institute, which the architects designed as, essentially, two interlocking buildings in one: an L-shaped clinical facility, and an elliptical atrium building wedged into its elbow. The curved component is not just an abstract formal gesture; it is a work of representative design, or architecture parlante, intentionally shaped like the brain's frontal lobe. "This is the very front part of our brain that makes us different from every other living thing," explains Chapman. "Architecturally, we created what we stand for."

Chapman's philosophy is also apparent in the institute's entry sequence. From a landscaped parking area, visitors proceed under the shade of a long canopy, through a com-

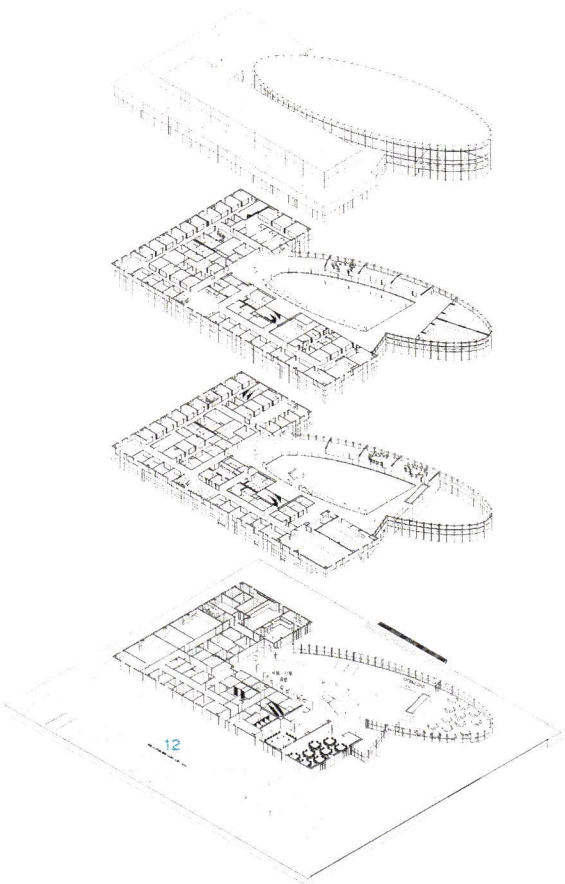


PICK YOUR PORTAL Nestled into a gray rectilinear building, an elliptical glazed volume (left) contains a light-filled atrium. A portico leads to the main entrance (above), but patients who prefer a lower-key experience can enter through an alternate door.

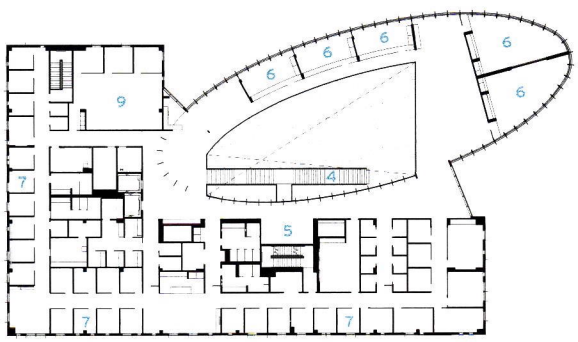
BRIGHT IDEAS
Generous glazing on the rooms (right) that encircle the atrium admit daylight into the corridors (opposite).



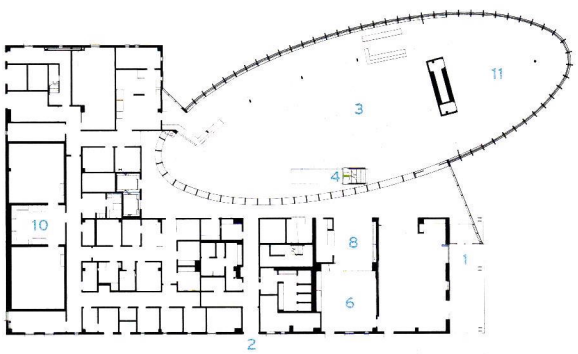




EXPLODED AXONOMETRIC DIAGRAM



THIRD-FLOOR PLAN



GROUND-FLOOR PLAN

0 30 FT.
10 M.

1 MAIN ENTRY
2 QUIET ENTRY
3 LOBBY
4 GRAND STAIR
5 WARRIOR LOUNGE
6 TRAINING ROOM
7 CLINICIAN OFFICE
8 BREAKOUT SPACE
9 VIRTUAL REALITY LAB
10 IMAGING SUITE
11 MULTIPURPOSE SPACE
12 GARDEN



pressed, slate-colored lobby, and into the light-filled, three-story atrium, a gathering space and waiting area. An exposed stairway rises up through the ovoid room, leading toward a cable-suspended paraboloid ceiling of blonde wood slats that brings visual warmth as it dissipates sound. "The convex aspect transfers noise to the perimeter of the room," says Ricardo Munoz, a project designer. At night, the building glows from within, advertising what is going on inside to passersby on the busy thoroughfare it faces.

A secondary entrance to the building, it should be noted, leads directly to an elevator bank, for those with conditions like PTSD, who do better without the "wow" factor. These patients can also decompress in "warrior lounges," on the second and third floors of the institute. These niche-like spaces, paneled in dark wood and with plush seating, are designed for those who might not be comfortable in the atrium's open settings, and are happier sitting in confined spaces where they cannot be surprised by someone's approach. "Some veterans don't like to be in open spaces, with people behind them," says Chapman.

The elliptical volume is a bravura work of structural engineering, supported by a ring of 78 steel fins, each 62 feet tall, that encircle its perimeter. Designed in collaboration with the revered Dallas engineer Tom Taylor, the 20,000-pound elements march around the exterior, separated by tall windows, creating an accordion effect on the facade.

"We wanted something to awe you, because the brain likes to be awed," says Chapman. "It changes the neurotransmitters." A large multipurpose room with a 30-foot ceiling that occupies one end of the oval illustrates those transmissions with an art installation suspended







NEURAL NETWORK An artistic representation of connections in the brain hovers above a multipurpose room with panoramic views (left). Geometric landscaping radiates from the perimeter of the ovoid volume (above).

from its ceiling. Created by David Gappa and titled *Introspection*, it is an abstracted interpretation of the brain's synapses, their firings illuminated by LEDs embedded in glass tubes.

Contrasting with the rounded structure it embraces, the L-shaped form is clad in cool charcoal gray panelized fiberboard with vertical window frames outlined sharply in white. The private offices within have windows to the outside and translucent glazing facing the hallway, allowing light to filter into the circulation spaces. Clinical "brain-training rooms," where clients can meet with clinicians for testing, counseling, or treatment, also line these corridors, and either admit daylight or block it, as per the demands of treatment.

"The thing Sandi said one thousand times was, 'Don't make it look like a hospital,'" says Speck. It doesn't, nor does the office component look like a typical open-plan layout, something the architects also intentionally avoided in response to the client's desires. "Open plan spaces can be devastating for brain productivity," says Chapman. "People have to put on visual blockers and headphones just to keep from being agitated. They have to work harder just to do the things they're doing." At the Brain Performance Institute, the architecture should keep the mind engaged, if not excited, but without the agitation. ■

Mark Lamster is the architecture critic of the Dallas Morning News *and a professor at the architecture school of the University of Texas at Arlington.*

credits

ARCHITECT: Page – Mattia J. Flabiano III, principal in charge; Lawrence W. Speck, design principal; Robert Doane, project director; Wenguel Yohannes, project architect

ENGINEERS: Datum Gojer Engineers (structural); Page (m/e/p); Pacheco Koch (civil)

GENERAL CONTRACTOR: Turner Construction Company

CONSULTANTS: Datacom Design Group (IT, acoustical); J.C. La Foy & Associates (landscape); Hossley Lighting Associates (lighting); lauckgroup (furniture)

SIZE: 60,000 square feet

CONSTRUCTION COST: $23.9 million

COMPLETION DATE: September 2017

SOURCES

ENTRANCES AND SLIDING DOORS: record-usa

ACOUSTICAL CEILINGS: Rulon, Armstrong

STOREFRONT GLAZING: Dorma

PAINTS AND STAINS: Sherwin-Williams

CARPET: Interface

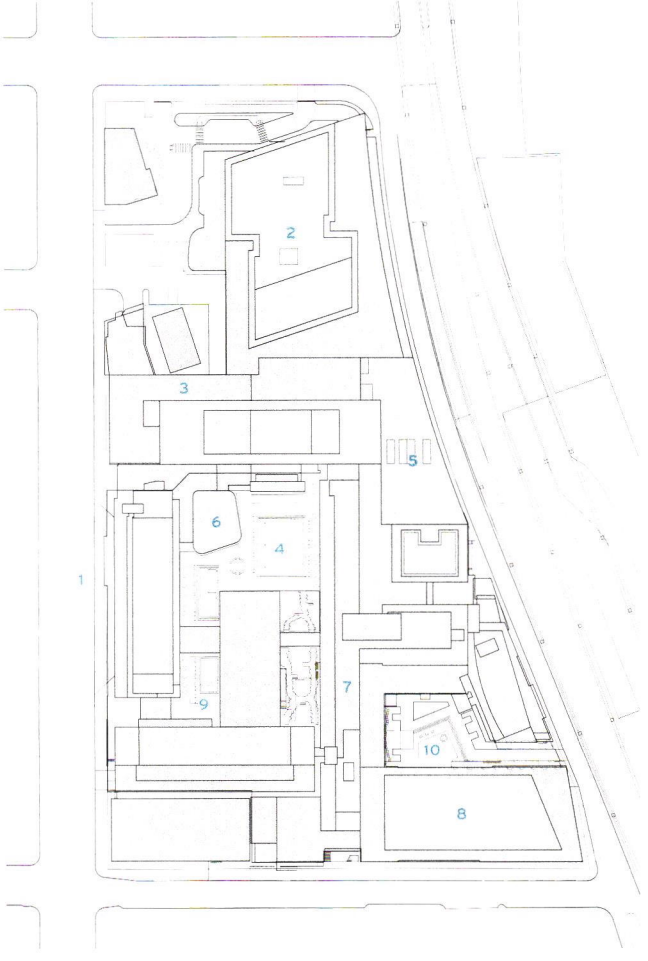
SHADES AND ENERGY MANAGEMENT: MechoSystems

NYU Langone Health | New York | Ennead and NBBJ

Healing Big-Time

An expanding urban hospital complex gains clarity, green space, and views under a carefully reworked master plan.

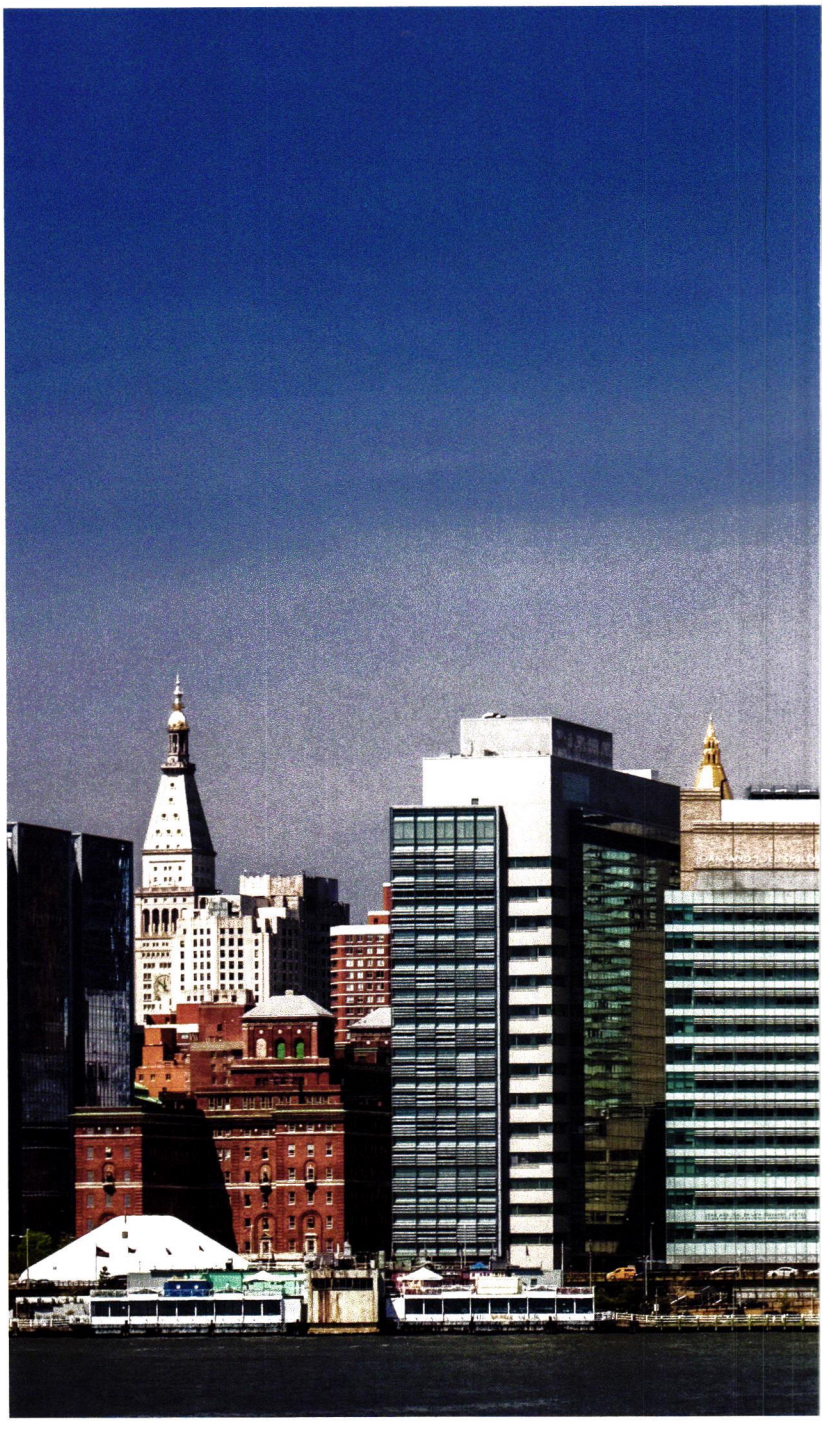
BY SARAH AMELAR



ROOF PLAN

0 150 FT. 50 M.

1 MAIN ENTRANCE
2 KIMMEL PAVILION
3 TISCH HOSPITAL
4 TISCH COURTYARD
5 ENERGY BUILDING
6 SKIRBALL INSTITUTE
7 MEDICAL SCIENCE BUILDING
8 SCIENCE BUILDING
9 FLECK COURTYARD
10 ALUMNI COURTYARD



In 1949, when Skidmore, Owings and Merrill designed a campus for New York University's medical center in Manhattan, the compound was a clean-edged Modernist composition, a rectilinear, sculptural ensemble on lawns overlooking the East River. But in subsequent decades, the center—now called NYU Langone Health Main Campus—added buildings and piecemeal interventions that diminished the clarity of the scheme on its 9.4-acre site.

Like other urban medical school–hospital campuses, this superblock—bound by 30th and 34th Street, First Avenue, and the FDR Drive—had acquired an almost ad hoc massing. Inside, awkward adjacencies and spatial allocations undercut functionality as well as patient and staff experience.



PHOTOGRAPHY: © JEFF GOLDBERG/ESTO

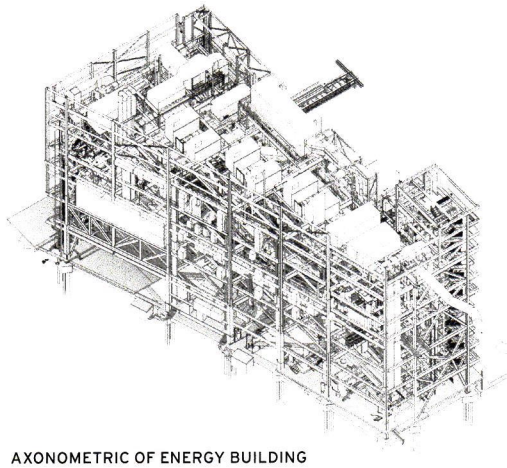
ON THE WATERFRONT Viewed from the East River (from left to right, above) are the Science Building (2018), Smilow Research Center (2006), Skirball (1989), Energy Building (low in foreground; 2016), Tisch Hospital (1963), and Kimmel Pavilion (2018).

In 2008, Robert I. Grossman, the medical school dean and CEO of NYU Langone Health, launched ambitious plans to transform the complex into a fully integrated "world-class" patient-care, education, and research center. The process began with a master plan by Ennead and NBBJ. Ten years and one devastating hurricane later, much of that vision has finally come to fruition.

In calibrating what to add, subtract, or modify, the architects analyzed the tight existing site and its context, identifying structures that had outlived their value and could be demolished. It was essential to reconfigure the public circulation for rational, intuitive wayfinding—bringing continuity punctuated by leafy courtyards—and orienting views out. Another key goal was to honor SOM's scheme, with the planar Tisch Hospital tower and its podium of interlocking buildings. As NYU Langone senior vice president Vicki Match Suna says, "We consider ourselves stewards of the original campus."

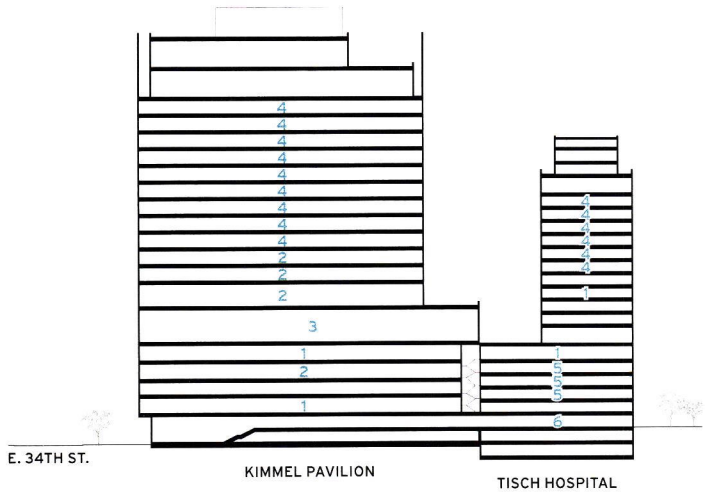
The 2008 master plan, implemented in phases while the medical center remained in operation, added three new buildings and organized the campus programmatically into zones: acute patient care, ambulatory medicine, and research/education. Ennead's 71,000-square-foot Energy Building was completed in 2016, and its 365,000-square-



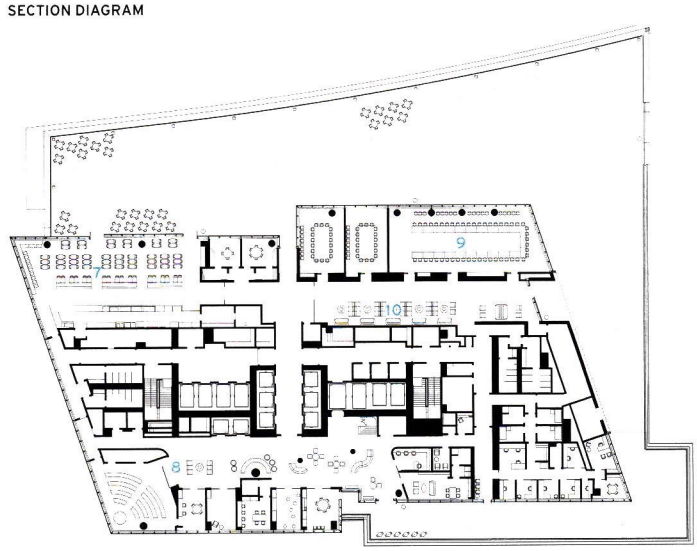


AXONOMETRIC OF ENERGY BUILDING

ENERGY BUILDING A dense 6-story structure (left) raises mechanicals above the floodplain. Next to the Kimmel Pavilion, it is slightly curved along the highway and the East River.



SECTION DIAGRAM



7TH-FLOOR PLAN

0 30 FT. 10 M.

1 PROCEDURE ROOM
2 PEDIATRIC ROOM
3 MECHANICAL
4 INPATIENT BED
5 ANESTHESIOLOGY/ BLOOD BANK/LABS
6 CAFETERIA
7 TERRACE CAFÉ
8 HASSENFELD CHILDREN'S CENTER
9 BOARD ROOM
10 CONFERENCE CENTER





KIMMEL PAVILION The new 21-story tower (opposite) offers individual patient rooms with sweeping views (above). Alyson Shotz created its lobby sculpture (right); Donald Lipski's *Spot* is a giant Dalmatian balancing a taxi at the entrance to Hassenfeld Children's Hospital (bottom).

foot Science Building in January. Last month, NYU opened the 830,000-square-foot Kimmel Pavilion, a state-of-the-art hospital tower by Ennead and NJJB, which includes Hassenfeld Children's Hospital. But in October 2012, as the Energy Building began construction, Hurricane Sandy struck, causing extreme flooding and even backup generator failure. Without functioning elevators, patients had to be evacuated down many flights of stairs and, for the first time in the institution's history, it closed (for months). NYU Langone ultimately recovered, with the aid of a $1.45 billion FEMA grant.

While the planned buildings were designed for resiliency, says Ennead partner Thomas Wong, "this was a chance to correct the entire campus." And that, adds Match Suna, "was the silver lining."

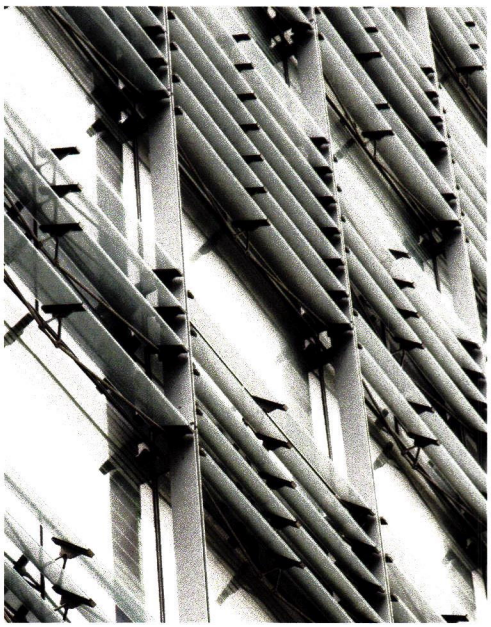
Bypassing phased updates, FEMA's funding enabled NYU to address the urgency of its existing conditions comprehensively. The recovery included installing robust perimeter flood barriers, gates, and seals, and permanently elevating critical infrastructure—mechanical, electrical, and IT systems—above the floodplain. Vulnerable low-lying elements, such as the main cafeteria, were also relocated. And Ennead addressed the severe inadequacy of the existing 18-story Tisch Hospital's elevators by adding a four-car bank alongside the original building, expanding each floor's lobby and lounge area, dramatically improving foot traffic.

For belt-and-suspenders resiliency, NYU developed strategically redundant systems, particularly with Ennead's riverfront Energy



PHOTOGRAPHY: © JEFF GOLDBERG/ESTO (OPPOSITE; TOP, LEFT AND TOP, RIGHT); AISLINN WEIDELE/ENNEAD ARCHITECTS (BOTTOM)





Building, finished in 2015. Inside this low structure—echoing SOM's play of horizontal massing—is a highly sustainable cogeneration plant, along with multiple self-reliant backup resources. With waste heat from the electricity-generating turbine converted into steam that powers its climate control year-round, the campus is on track for LEED Platinum certification.

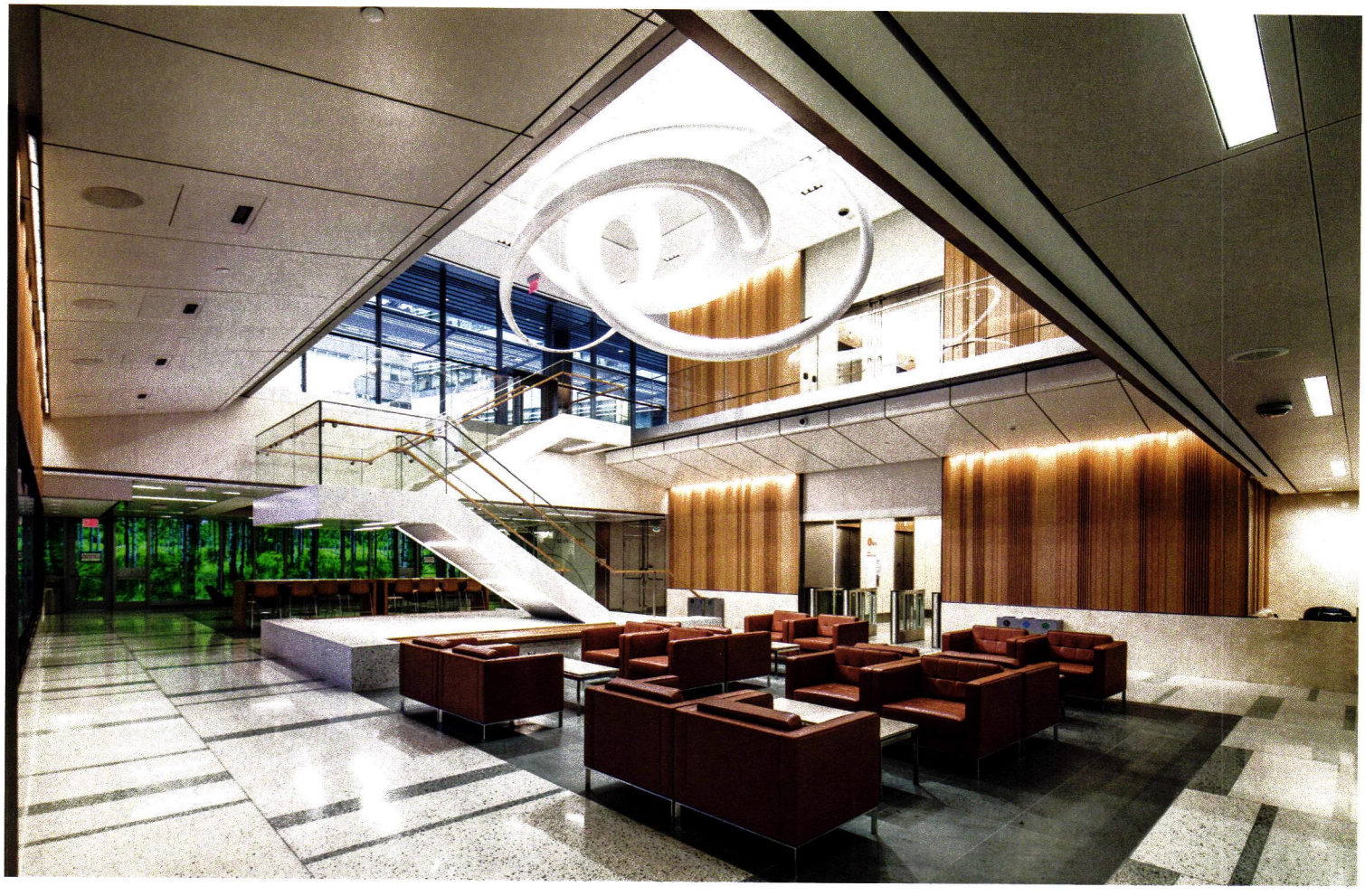
A top NYU priority was to make the medical center outstandingly comfortable, safe, functional, and appealing for patients, as well as visitors, doctors, and staff. That's especially evident in the 21-story Kimmel Pavilion, the city's first hospital building with all single-occupancy rooms. But before it could rise, at the campus's north end, daunting challenges needed resolution. Two Amtrak tunnels cross under that land, about 60 feet down, and no new loads could rest on them; also, the site's eastern side is unstable riverfront landfill. The solution was a bridgelike structure, spanning the Amtrak zone with 30-foot-deep trusses (through Kimmel's 6th-floor mechanical plenum), from which operating rooms hang, and on which 11 patient floors rest. Pilings through



TYPICAL-FLOOR PLAN - HEALTH BUILDING

1 LABORATORY
2 LAB SUPPORT
3 OFFICE
4 CONFERENCE/BREAK ROOM
5 CORE

PHOTOGRAPHY: © RENE PEREZ (LEFT; OPPOSITE, TOP); AISLINN WEIDELE/ENNEAD ARCHITECTS (RIGHT); ELLIOT GOLDSTEIN (OPPOSITE, BOTTOM)





SCIENCE BUILDNG On the southern edge of the campus is the new 16-story tower for education and research. A brise-soleil and fritted-glass louvers filter light to labs (opposite, right, and below); the lobby, punctuated by Moriko Mori's mobile (above) opens onto Alumni Courtyard.

the landfill go down 100 feet into bedrock, and the building's footprint, a parallelogram, follows the tunnels' skew.

Kimmel has two main entrances: on First Avenue and 34th Street for adult patients and a dedicated one on 34th Street for the children's hospital within the same building. Place-making sculptures mark both portals: a 38-foot-tall Dalmatian balancing a taxicab on its nose fronts Hassenfeld, and a monumental, light-bouncing, skeletal mobile animates Kimmel's six-story atrium lobby amid overlooking balconies and huge, cityscape-framing windows.

Upstairs, the 374 beds comply with the single-occupancy-only requirement for new hospital construction and renovations, mandated in 35 states (in New York as of 2010). Its advocates cite greater infection control, privacy, and the healing benefits of quiet space and loved ones' staying with patients. Solo rooms also optimize bed availability, since room-share-limiting issues like gender or contagions no longer apply. Tisch will be converted in phases to all single-occupancy too. But its real integration with Kimmel occurs in their joint podium, where the expanded emergency room extends into both buildings, and operating room procedure floors connect. "Tisch and





Kimmel," says Wong, "will perform as one hospital with two bed towers."

The medical center plans to add many of Tisch's operating rooms to Kimmel's 30 new ones. But, given health-care trends toward more outpatient procedures and shorter hospital stays, the combined post-renovation bed count is not likely to increase significantly from Tisch's current tally of 565.

Kimmel's rooms are stunningly appointed, each with sweeping views, a fold-out sofa for visitors, and a 75-inch flat-screen monitor, enabling patients to order meals, adjust climate control, learn about their health conditions, conduct live video conversations, and watch movies. The nearly floor-to-ceiling windows, with fritted low-E glass, are triple glazed to cancel noise.

In many ways, NYU has chosen to exceed minimum requirements, despite the expense. Its innovative infection-control measures include translucent sliding-glass doors to patient rooms instead of bacteria-harboring privacy curtains. And parallel routes separate onstage from offstage traffic, removing patients from distracting back-of-house activity. To alleviate stress for staff, patients, and visitors, says NBBJ partner in charge Joan Saba, "the whole place was designed so you're never more than one turn away from daylight"—even the corridors outside Kimmel's ORs have panoramic river views.

Patients and staff can also step outdoors. The seventh floor, which includes cafeteria and conference areas, has landscaped terraces designed by Hargreaves Associates—one just for kids. (Hassenfeld also has whimsical New York–themed play areas.)

But before Kimmel existed, Ennead introduced, in its Science Building, a language of interior forms and materials that would unify the broader complex while giving each place a distinctive character. In 1993, the Polshek Partnership (a precursor to Ennead) completed the multiuse Skirball building, which organized the campus with a main entrance and reception lobby, along First Avenue. But the medical school still lacked a clear physical identity, or even its own front door.

Now that's changed with the new 16-story Science Building, a gateway, at the campus's south end, to its academic-research areas. Like Kimmel's luminous multistory lobby, with dynamic artworks, wood accents, and surrounding overlooks, the Science Building, entered from 30th Street, is soaring and daylit, with a central, pendant sculpture amid second-floor balconies, and a ground-floor café opening out to the landscaped Alumni Courtyard.

Around the leafy quad, Ennead's new building connects with existing research structures. Along with the communal spaces, the science tower's open laboratory floors upstairs, designed for flexibility to accommodate emerging technologies, encourage collaboration. To allow the research areas prime south-facing river views, the architects devised a brise-soleil, with fritted-glass louvers that cut glare and heat gain.

From upper floors, views now take in terraces and courtyards, as well as a newly planted roof on a low 1952 SOM building. When lab consolidations and relocations are complete, the tortuous ductwork along courtyard walls will disappear, enhancing the experience.

This thoughtful and extremely challenging campus transformation (of undisclosed cost), is not about wild, reinvent-the-wheel architectural form. It's more about well-considered consistency, compatible language, attunement to users, fluid circulation, and rethinking existing conditions to tie it all together. Without being derivative, Ennead has extended the original design's perpendicular play of mid-rises versus towers. But, apart from Kimmel—which gains some lightness from its sleek, glass curtain wall skin—the massing density can feel imposing from First Avenue. Yet within the complex, many scales, along with diverse places of respite and activity, reveal themselves. When asked whether NYU Langone's metamorphosis is almost done, Match Suna replied: "Yes and no. We've accomplished a real transformation, but the nature of a medical center—which this design recognizes, anticipates, and accommodates—is that it's always evolving." ■

PHOTOGRAPHY: © DEREK MCCLING/TURNER CONSTRUCTION (TOP); RENE PEREZ (BOTTOM); JEFF GOLDBERG/ESTO (OPPOSITE)

SYLVAN SETTINGS Joanna Pertz Landscape Architecture designed the Alumni Courtyard, the Fleck Courtyard (opposite, top and bottom), and the large Tisch Courtyard in front of Ennead's new elevator tower (right), next to the Skirball Institute of Bionuclear Medicine.



credits

ARCHITECT: Ennead Architects – Duncan Hazard, partner in charge; Todd Schliemann, FAIA, Thomas Wong, design partners; David Tepper, management principal; Elizabeth Arnaiz, Lois Mate, Marissa Sweig-Trigger, project managers

ASSOCIATE ARCHITECT: NBBJ – Joan Saba, FAIA, Jay Siebenmorgen, Kristen Clay, Catherine Alberte, lead designers

ENGINEERS: Langan (civil); Jaros Baum & Bolles (m/e/p/fp); Leslie E. Robertson Associates (structural for Kimmel, Energy Building, emergency department); Severud Associates (Science Building)

CONSULTANTS: Heintges Consulting Architects & Engineers (curtain wall); Jacobs Consultancy (lab planning); Two Twelve Associates (graphics); Hargreaves Associates, Joanna Pertz Landscape Architecture (landscape); Atelier Ten (lighting design, sustainability)

CLIENT: NYU Langone Health

SIZE: 1.5 million square feet

COST: withheld

COMPLETION DATE: June 2018

SOURCES

GLASS CURTAIN WALL: Viracon

METAL PANELS: Centria, Pohl, Kingspan, Sobotec

METAL ROOFING AND OTHER: Overly Custom Metal Systems and Overly Panels, Hanover Pavers, Zinco Green Roofing

PATIENT ROOM DOORS: Assa Abloy

CLOSERS: Dorma

ACOUSTICAL CEILINGS: Armstrong, Decoustics, Lindner, ACGI

ACOUSTICAL FABRIC WALL PANELS: Decoustics with Carnegie Fabrics

SOLID SURFACING: Wilsonart, Corian, 3Form, LG Hausys, Krystalcast, Caesarstone

PAINTS AND STAINS: Benjamin Moore, Sherwin-Williams, Tnemec, Corotech, PPG

GLAZING ASSEMBLY: TGP

LIGHTING: USAI Lighting, B-K Lighting, Bega

ELEVATORS: Thyssenkrupp

TOILETS: American Standard



Casey House | Toronto | Hariri Pontarini Architects

Health by the Hearth

An independent hospital for HIV/AIDS patients creates a comfortable, welcoming environment for medical care.

BY ALEX BOZIKOVIC

PHOTOGRAPHY BY DOUBLESPACE PHOTOGRAPHY

Stepping through the front entrance of Casey House, the first thing you see is a hearth. The main doors of the Toronto hospital for HIV/AIDS patients open to a tall lobby, lined with rough-cut and honed limestone and centered on a fireplace. The symbolism is clear: this is, as the name suggests, a place to feel at home.

That's a rare quality in a health-care facility, but it is crucial to the care and culture here at Canada's only independent HIV/AIDS hospital. Founded as a hospice in 1988 by journalist and activist June Callwood and named for her late son, the institution is located in Toronto's Gay Village. Its clients, as the hospital prefers to call them, include a sizable number of homeless people. "Our clients tend to be very much in the margin," says Casey House CEO Joanne Simons. "Most have suffered some form of trauma in their lives. We hope within this space to empower them so that they can take care of themselves and feel compassion, dignity, and worth."

The design by Toronto-based Hariri Pontarini Architects (HPA), which won a 2018 national Governor-General's Medal in Architecture from the Royal Architectural Institute of Canada and the Canada Council for the Arts, does just that. Completed in 2017, the project connects 59,000 square feet of new construction with a grand three-story Victorian house dating back to 1875. The U-shaped addition, which combines a 3-story linear masonry volume punctuated by a taller glazed tower, creates a perimeter block that runs predominantly east–west, surrounding a courtyard planted with shrubs and loquat trees. "From the garden outward, this place is life-affirming and life-giving," says architect Siamak Hariri. "It tries to respond to the challenge, 'How do we create a sense of warmth, intimacy, and care?'"

One answer, visible in the atrium, is through the use of natural materials. HPA added custom millwork in strategic places, such as the lounge and the nurses' station on each floor, using walnut and Algonquin limestone finished with special coatings that allow for

PATCHWORK PRESENCE In a nod to the quilts that memorialized patients in the 1980s, the elongated southern facade alternates materials.



frequent sterilization. In health-care facilities, "normally you would get stainless steel and Corian," Hariri says. "Here you get stone, wood, elements that create a sense that you're not in the hospital."

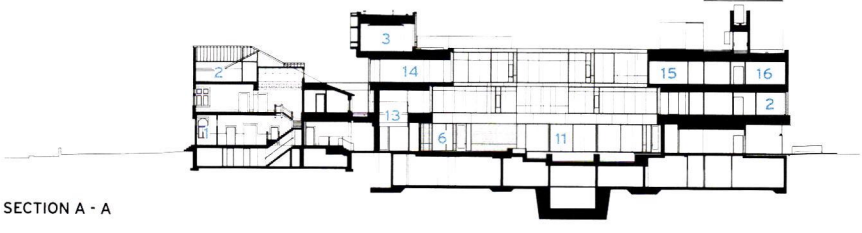
The abundance of natural light, enabled by the unusually small floor plate and perimeter-block layout, enhances that effect. The architects stacked 14 inpatient rooms on the upper floors, in single-loaded corridors that overlook the garden. In this area, the hospital delivers palliative care to patients at the end of







DOMESTIC DETAILS Subtle touches such as a fireplace in the lobby (opposite), original molding and stained-glass windows in a stairwell of the Victorian house (left), and a "headboard" panel in patient rooms to conceal medical equipment (above) enhance the homey feel.



SECTION A - A



GROUND-FLOOR PLAN

0 20 FT.
6 M.

1 ENTRANCE VESTIBULE
2 OFFICE
3 MEETING ROOM
4 THERAPY ROOM
5 COMMUNITY KITCHEN
6 LIVING ROOM
7 INTERACTIVE SPACE
8 ASSESSMENT ROOM
9 DINING
10 KITCHEN
11 COURTYARD
12 LOCKERS
13 ATRIUM
14 LOUNGE
15 MEDICATION ROOM
16 TREATMENT ROOM

their lives and, more frequently, specialized subacute care—often treating illnesses that occur alongside HIV/AIDS, helping patients through postsurgical recovery and helping them organize future care. Each of these private rooms has outward-facing windows with highly reflective glazing. The courtyard ends to the east at the atrium, which in turn is lit through a skylight. "At certain times of day, you see a shaft of light cut through into the center of the building," Hariri says. The rest of the main floor, meanwhile, houses a cafeteria and clinic facilities for an outpatient program that serves 200 patients per day.

Casey House, like all hospitals in Ontario, sees its operations and capital costs largely covered by the provincial government. The remodel and addition were funded in part by an $8 million private capital campaign. But Casey House's design goes outside the government's usual guidelines, in part through its adaptive reuse of a Victorian house. That building, its interior restored by ERA Architects, contains administrative offices as well as space for counseling sessions and public events. Subtle adjustments to the floor levels allow continuous barrier-free access—and visual connections—between new and old facilities. The house provides a very public front door, facing Jarvis Street—once Toronto's best residential address and now a heavily trafficked artery. This, Simons explains, is critically important: while patients value their privacy, "we want to fight the blame and shame associated with HIV," she says. Accordingly,





COURTSIDE A narrow reflecting pool (temporarily covered with black netting) runs the entire length of the courtyard (left). Daylight-filled corridors with warm wood finishes overlook the space (bottom).

Hariri's team designed the long southern facade of the building, which faces a side street, to resemble a quilt—an art form that, in North America's gay communities in the 1980s, became a device to memorialize those lost to HIV/AIDS. The elevation is woven of roman brick in three hues, dark tinted glass, and crust-faced limestone. It is a subtle but very public piece of symbolism that expresses the institution's values in architectural form. "In the '80s, during the HIV crisis, there was huge stigma around the virus," says Simons. Now "we're making a very bold statement," she says. "We're not hiding anymore." ■

Alex Bozikovic is the architecture critic for The Globe and Mail *and author of* Toronto Architecture: A City Guide.

credits

ARCHITECT: Hariri Pontarini Architects – Siamak Hariri, partner in charge; Michael Boxer, Jeff Strauss, Edward Joseph, design project managers; Howard Wong, Cara Kedzior, Rico Law, Patrick Cox, John Cook, Andria Fong, team

ASSOCIATE ARCHITECT: ERA Architects (heritage consultant)

ENGINEERS: WSP Canada (mechanical and electrical); Entuitive (structural)

CONSULTANTS: Mark Hartley Landscape Architect (landscape); David Hine Engineering (code)

GENERAL CONTRACTOR: Bird Construction

CLIENT: Casey House

SIZE: 59,000 square feet

COST: $30.8 million

COMPLETION DATE: September 2017

SOURCES

BRICK: Cloud Ceramics

STONE: Algonquin Ledgerock

METAL PANELS: Agway Metals

CURTAIN WALL: AGC Flat Glass

DOORS: Trillium Architectural Products

ACOUSTICAL CEILING: Rockfon

FLOOR AND WALL TILE: Stonetile

ELEVATORS: Kone

CUSTOM WOODWORK: Provincial Store Fixtures

WOOD FLOORING: Terra Legno

RESILIENT FLOORING: Mannington

FURNITURE: Steelcase, Kiosk

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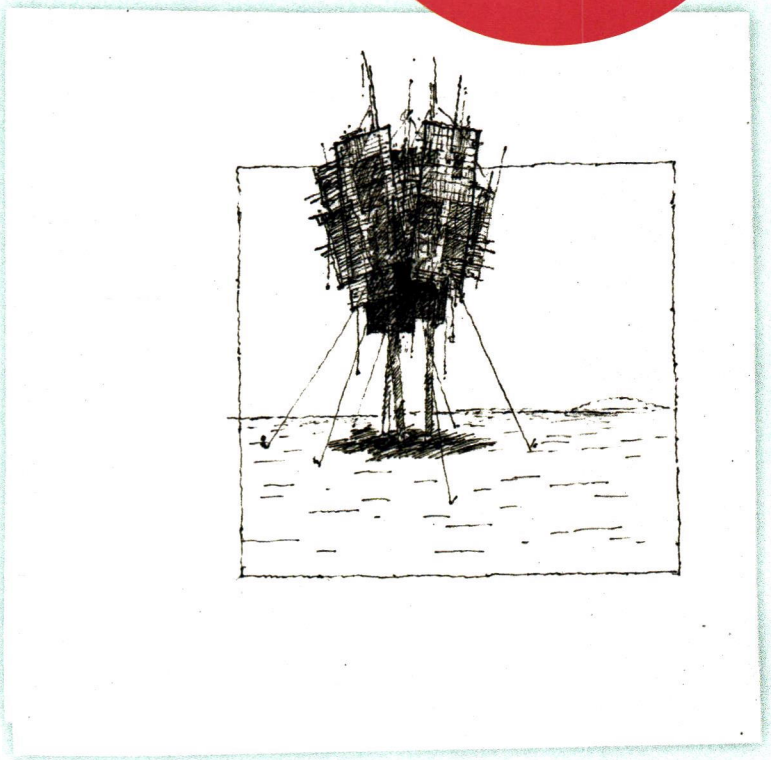
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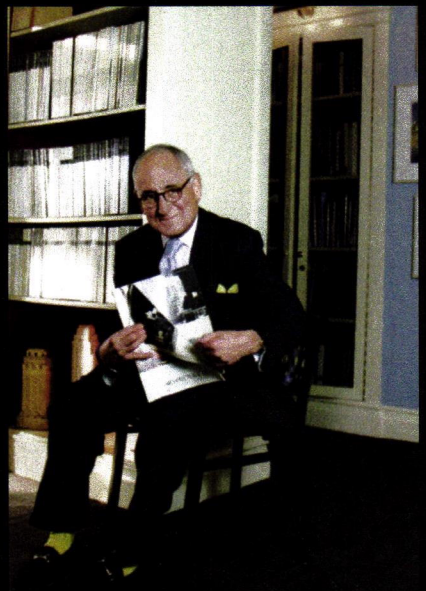
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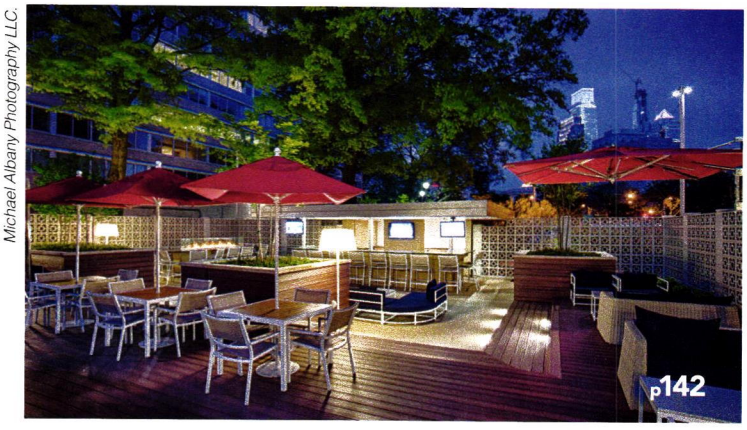
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Integrated Approaches to Control Moisture in Buildings

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Expansion Joint Fire Barriers: Principles, Practices, and Problems

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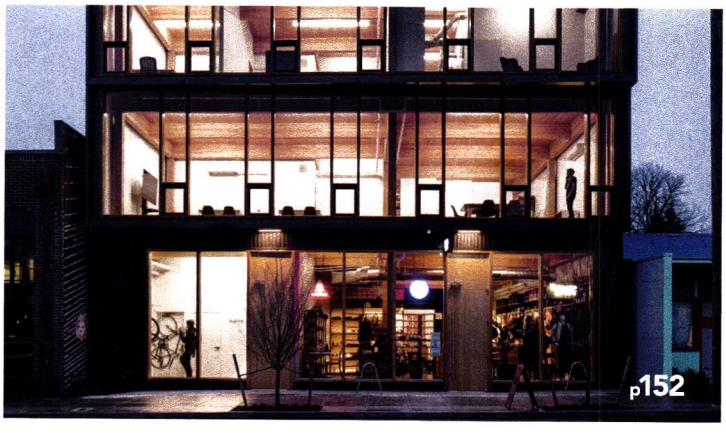

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Photo courtesy of Xypex Chemical Corporation

Water and moisture can come from a variety of places and be a problem for multiple parts of a building. Controlling where moisture does and doesn't go is critical to the successful performance of a building and achieved by focusing on products and systems with the right capabilities. Pictured is 60 Holborn Viaduct located in London.

Integrated Approaches to Control Moisture in Buildings

High-performance products integral with other systems can create better results

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By Peter J. Arsenault, FAIA, NCARB, LEED AP

Moisture in buildings is probably one of the most investigated, discussed, reviewed, and researched challenges in building design and construction. There are good reasons for this. Consider the Building Assessment Survey and Evaluation (BASE) study that was conducted by the US Environmental Protection Agency (EPA) in the 1990s. It found that among the randomly selected public and private office buildings studied across all 10 climate zones in the United States, 85 percent had been damaged by water at some point, and 45 percent had leaks at the time data was collected. That data indicates that most buildings are likely to experience some form of impact from unwanted or excessive moisture accumulation. Those conditions can lead to serious problems, such as the degradation, deterioration, or even failure of building materials, development of mold and mildew, and possible risks to human health and safety. Repairing any of these conditions after the building is constructed and occupied typically involves opening up construction assemblies, which is disruptive, time-consuming, and costly. Hence, it is no wonder that there is great interest in understanding how moisture can be controlled in buildings at the outset to avoid any or all of these potential problems and risks.

The Whole Building Design Guide (WBDG), a program of the National Institute of Building Sciences, provides some of the best, objective, state-of-the-art thinking on this topic. It identifies three main causes of moisture movement, namely, water impingement or leakage (as in a roof, wall, or floor system), movement of moist air (through gaps or openings in roofs, walls, or floors), and vapor diffusion through materials that can

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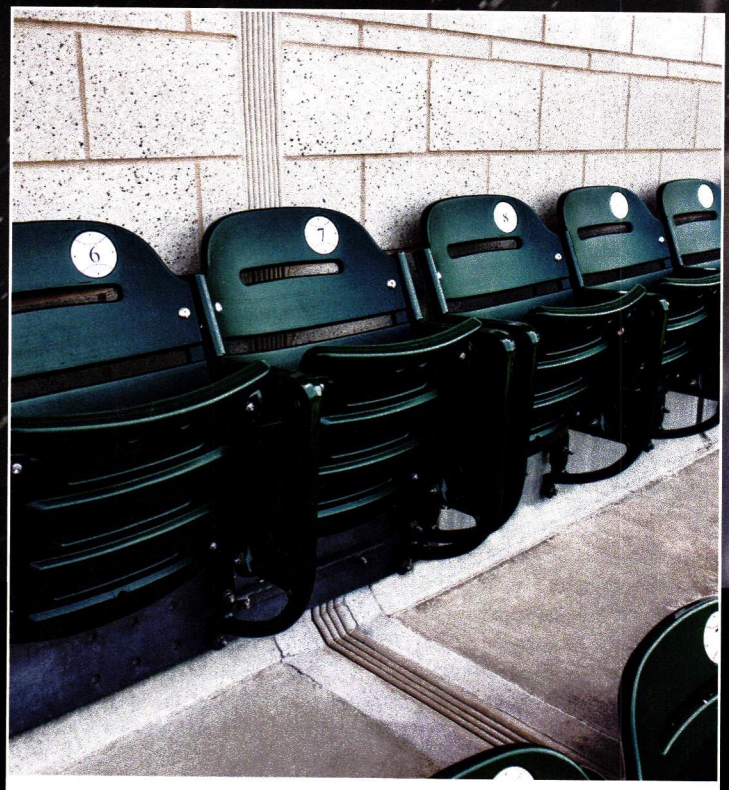
Learning Objectives

After reading this article, you should be able to:

1. Identify and recognize the significance of water and moisture penetration in a building based on its effects on materials and people.
2. Assess the means available to provide waterproofing of concrete for foundations and other building systems.
3. Explain the importance of continuity of water-resistant barriers in wood-framed construction and integrated approaches to achieve it.
4. Determine how to specify expansion joints and covers that are integrated into construction assemblies with attention to water and moisture control.

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One Hyde Park, designed by Rogers Stirk Harbour + Partners, is tagged as 'the most luxurious address in London.' Crystalline concrete was selected for this project as a waterproofing and protection solution for the three-level basement slab and wall areas, attenuation tanks, podium slab, and penthouse roofs. It was also used for the traditionally cast and post-tensioned concrete, while also being utilized as a remedial solution for areas adjacent to the existing structure.

occur slowly over time but saturate and damage materials nonetheless. The WBDG points out that solutions cover the gamut of design and construction activities, stating, "Preventive and remedial measures include rainwater-tight detail design; prevention of uncontrolled air movement; reduction of indoor air moisture content; reduction of water vapor diffusion into walls and roofs; selection of building materials with appropriate water transmission characteristics; and proper field workmanship quality control." Listed all together, that may sound like a tall order, but in essence, it means that everyone involved in a building project has a role to play in managing moisture in buildings, starting with the design team.

In this course, we will look at three specific areas that are common to buildings, namely concrete foundations, wood-framed enclosures, and expansion joints. Each of these areas will be looked at for their general and specific issues related to moisture management, with some example solutions noted for each.

CONCRETE FOUNDATION WATERPROOFING

Foundations are necessarily in contact with the earth, which is known as a source of water infiltration into buildings. There are certainly some site-engineering approaches for draining water away from a foundation or adding drainage systems around the outside of a building, and their use is common. However, it is also common to provide some type of waterproofing system to keep any water from passing through the concrete. However, achieving that can be challenging since the formation of cured concrete produces a myriad of air gaps, holes, pores, capillary tracts, and other internal voids. Further, concrete shrinks in size as it cures, although if it is cured properly, that shrinkage can be kept to a minimum. Nonetheless, visible cracks or much less-visible microcracks can occur. The end result is that while concrete may appear strong and impenetrable on the surface, it actually ends up quite porous due to the variety of openings and voids inherent within it. This porosity means that water can penetrate into and even through a concrete structure, causing water seepage that is usually not desirable.

Over time, the inherent water permeability limitations of concrete may get more pronounced in several ways. First, any exposed surface can be physically damaged due to physical force, abuse, weather, etc. Such physical damage can cause the surface of the concrete to crack or break, exposing the inner aggregate and creating a rough surface that is vulnerable to moisture absorption and further deterioration. Secondly, the permeable nature of concrete can allow not only water but also soluble chemicals to penetrate into the foundation and cause deterioration of the concrete or corrosion on any metal components embedded in the concrete. This can include reinforcing steel, anchors, sleeves, post supports, angles, or any other metal that is used with concrete structures.

Surface treatments: In any of these conditions, concrete deterioration fueled by moisture can produce aesthetic, functional, or structural problems if not treated properly or prevented. To overcome these issues, there are several approaches. A common one is to use a surface coating to waterproof the concrete, thus keeping not just water out but chemicals and other harmful substances too. This approach is based on applying a protective coating either in liquid or sheet form over the concrete. Either one has an inherent limitation, however, in that they are not integral to the concrete but rather an applied layer on top of it. This means their success is entirely dependent on the workmanship of the installation and ultimately the full adhesion to the concrete surface to prevent it from separating and peeling off. This can be a particular challenge in locations where the concrete shape is irregular or where different sections meet and the coating needs to conform to multiple underlying shapes.

Admixtures: A different approach to waterproofing concrete is the use of specific chemical admixtures to make the waterproofing completely integral to the concrete itself. Admixtures, in general, have been used for decades to improve the performance of concrete in a variety of ways. Their first widespread use was to extend the temperature range that concrete could be poured without fear of freezing. They also became common to improve the workability of concrete through plasticizers that allowed less water in the mix while still retaining adequate slump (formability). Building on this proven success, some specific admixtures have been developed for waterproofing concrete that are based on filling and sealing all pores, small cracks, and openings with solid crystallized material. Referred to as crystalline technology or crystalline concrete, it has achieved some impressive results.

Crystalline concrete: In essence, crystalline technology takes advantage of the natural and porous characteristics of concrete. When a cement particle hydrates, the reaction between water and the cement causes it to become a hard, solid, rocklike mass. The reaction also generates chemical by-products that lie dormant in the concrete. Crystalline technology adds another set of chemicals to the mixture. With water as the catalyst, specific chemical admixtures are used that react with the natural by-products of cement hydration (calcium hydroxide, mineral salts, mineral oxides, and un-hydrated and partially hydrated cement particles). When these two groups, the by-products of cement hydration, and the crystalline chemicals are brought together in the presence of moisture, a chemical reaction occurs. This reaction forms a nonsoluble crystal that grows to form a web-like crystalline structure within the interconnected pores and other voids in concrete. In this way, the crystalline structure becomes a permanent, integral part of the concrete itself. Because it is nonsoluble, it fills the voids, cracks, capillaries, pores, and other openings to make the concrete impermeable, thus preventing the ingress



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of water and other liquids even under strong hydrostatic pressure. That means it also protects against liquid-borne chemicals that can deteriorate concrete or corrode steel reinforcing, even in harsh, aggressive environments or under high hydrostatic pressures.

Integral crystalline technology products are manufactured in the form of a dry powder compound consisting of portland cement, very fine treated silica sand, and selected chemicals. It is the chemicals that react with the by-products of cement hydration to produce the nonsoluble crystalline formation. Specific formulations are produced for application either as a coating material, concrete admixture, or dry shake product applied to the wet concrete and troweled in. It can be incorporated into a structure as it is being constructed or later on in the life cycle as a maintenance material that will further enhance its durability. As such, crystalline concrete is a viable method for waterproofing building foundations that can be used as a stand-alone system or as part of an integrated waterproofing system incorporating surface membranes. Crystalline waterproofing can reduce costs, accelerate construction schedules, and be used where other waterproofing methods or assemblies are difficult or impractical.

WOOD-FRAMED MOISTURE PROTECTION

Designing and constructing wood-framed buildings commonly involves several different trades working on the roof and wall systems. As we have already noted, these are places where water- and air-borne moisture can infiltrate a building and cause damage. This is the reason that building codes like the International Building Code (IBC) and the International Residential Code (IRC) require a water-resistant barrier (WRB) on the exterior side of wood sheathing. Achieving that is commonly done with a field-applied material, such as rolls of housewrap or spray, on material over the exterior sheathing. This approach necessarily relies on the skills and capabilities of the installers to achieve a truly continuous, water-resistant solution.

Integrated engineered-wood sheathing: In recent years, alternative products have emerged to address the need for a WRB layer that can be consistent and reliable with less susceptibility to variable labor and field conditions. Referred to as integrated engineered-wood sheathing systems, these products are used as structural sheathing in single-family, multifamily, and light-commercial Type 5 construction projects for non-fire-rated roof decks and exterior walls assemblies. They also have additional properties that have been shown to reduce the risk of moisture damage in several ways. First, and perhaps most significantly, a WRB layer is manufactured (not laminated) in the factory onto the exterior surface of these engineered wood panels. This eliminates the need for designers to specify a separate layer and gives construction crews one less thing to install. Second, integrated engineered-wood sheathing effectively addresses the seams between sheets with a high-performance tape that creates full contiuity of the WRB. Third, states like Oregon or elsewhere are requiring rainscreens or enhanced drainage planes behind the final cladding (siding, masonry, etc.). In response, these products have been tested per the applicable ASTM standards and shown to meet the code definition of an enhanced drainage plane with 90 percent drainage efficiency. Finally, due to the integrated engineering aspect of these products, they not only provide full WRB protection, but they also qualify as an air barrier to keep out unwanted air infiltration. This air-barrier quality means that it helps prevent airborne moisture from penetrating into a construction assembly too.

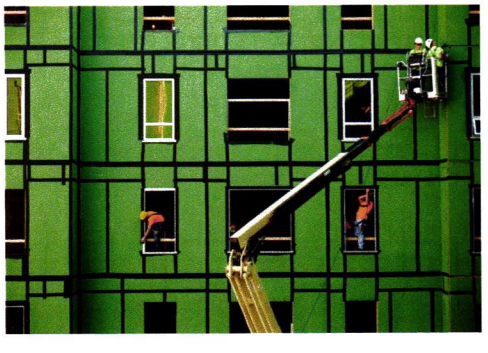
In order to achieve the needed full protection and continuity of a WRB and air barrier, proper taping and flashing is needed around window and door openings, penetrations, and junctions of different assemblies (wall/roof, wall/foundation, etc.) This can be accomplished in one of two ways:

Tape and flashing products: High-performance tape products that are made from an advanced composite acrylic provide superior adhesion, aggressive bonding, and resistance to ultraviolet (UV) light exposure. Some of these tapes are especially formulated for use with integrated engineered-wood sheathing for full compatibility and should be specified as a coordinated system. Such specialty tape can use a pressure-activated formula with a specific viscoelasticity that provides the right balance to form an ionic bond with the WRB layer. Such tape can also be manufactured and specified with four distinct layers including slip resistance (since it's used in roof applications), UV protection, a bonding layer, and eight mils of acrylic adhesive.

In addition to sealing the joints of integrated sheathing panels, this tape can be used as flashing to cover the exposed framing and face of the sheathing on window and door heads, jambs, and sills to create a continuous protective layer that seals out water and air around these openings. Such flashing tape is commonly available in 4- and 6-inch widths in both a straight flashing formulation and a stretchable version. The stretchable tape is also available in 10-inch widths to provide the appropriate coverage in a single installation over the full depth and perimeter of the openings as opposed to piecing multiple tape segments together. The fully flashed opening is then ready to receive a window or door unit, which may then be further counter flashed over or around integral flanges using the same flashing tape. In either case, the tape is pressure rolled into place using handheld rollers to assure a complete and uniform bonding. If stretchable tape is used, it is particularly well suited to irregular-shaped window openings or even curved/rounded openings.

Liquid flashing products: Much like other liquid waterproofing products, liquid flashing formulated for integrated engineered-wood sheathing can be applied to create a continuous, seamless condition around windows, doors, and other openings. It is also particularly well suited to variable surface conditions, such as wood to masonry transitions (i.e., wall to foundation), round, curved architectural details, or parapet walls. It is common for products like these to be hand-applied using a towel or a brush onto a surface, such as sheathing, framing, metals, etc. Once applied, it is intended to dry to a complete and continuous water- and air-proof seal around all portions of the condition being flashed. Since it is usually the thickness of the application that is important for quality control, applicators likely need to be trained in the installation of these flashing products, and on-site quality control becomes very important. Such liquid flashing products can also be stronger and higher rated than some tape systems, making them particularly suitable for upper stories in multifamily buildings subject to higher wind ratings.

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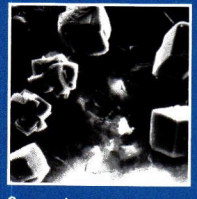
Integrated engineered-wood sheathing provides a continuous defense against water in wood-framed construction when paired with self-adhering tape and liquid flashing.

Concrete Waterproofing by Crystallization

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Xypex Crystallization (Initiated)



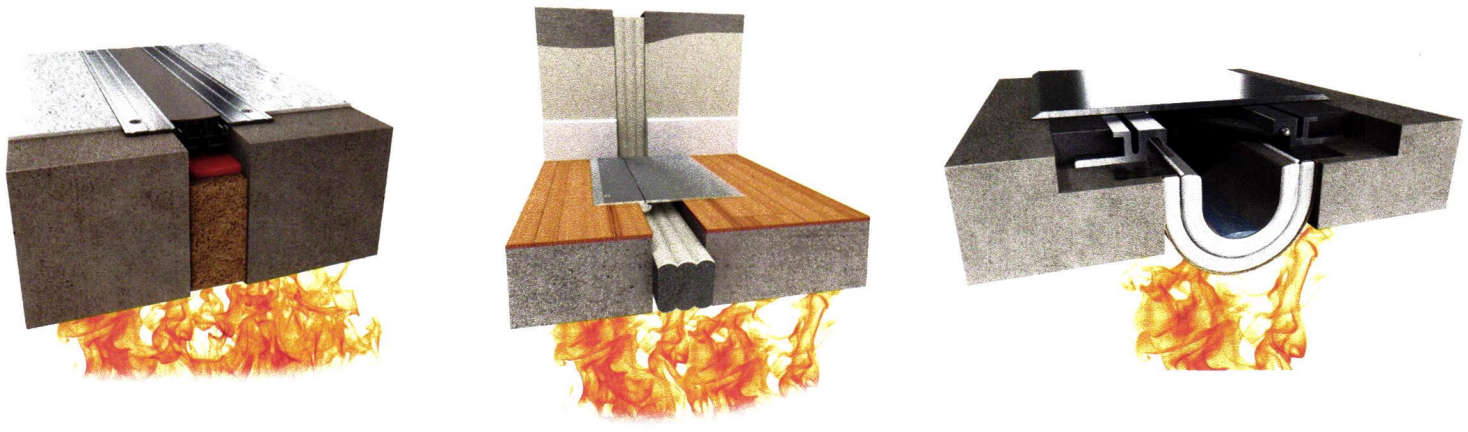
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Three common types of expansion joint systems that can resist both water and fire include compression systems with mineral wool (left), waterproof, fire-rated foams (center), and waterproof fire blankets (right).

Part of the effectiveness of liquid flashing is that it can be applied with optimal viscosity to flow easily into irregular shapes and surfaces, such as recessed windows, corners, roof valleys around chimneys, and pipe penetrations. Typically, such flashing can be weather resistant and tack free in as little as 20–40 minutes. Even better, since it is available in a moisture-curing formula, the liquid flashing membrane can bond and cure in otherwise unfriendly site conditions, including wet weather and damp substrates. At least one is backed by a 180-day exposure guarantee, meaning that if it remains uncovered for up to six months, it will still perform. In the end, it is usually the architect's preference whether to use liquid-applied flashings or other systems, but the versatility and durability of these products cannot be ignored, particularly for long-term solutions on larger and taller buildings.

KEEPING EXPANSION JOINTS WEATHER TIGHT

Architectural expansion joints are often necessary, predetermined gaps in structures that are designed to absorb environmental movement in buildings. When done right, they tend to be integrated with their construction such that they blend in with a design and almost disappear. Hence, it is easy to overlook the fact that they can be a potential source of water and moisture infiltration and damage. That infiltration could be problematic for the expansion joint itself, or it could cause problems for other building materials or occupants too. Either way, when using expansion joints that need to cut across exterior surfaces, their ability to resist water needs to be factored in along with the other requirements for the joints.

At the most basic level, expansion joints are a necessary component that must be engineered to handle movement between adjacent structural sections or components. Filling the resulting gap with an appropriate material that can expand and contract along with the building is the essence of expansion joint filler and cover design. The details of both the material used and its connection to the adjacent surfaces are what manufacturers of these systems focus on to assure that successful products and applications are possible. For example, when a joint filler and cover are used for floors, high durability is needed to withstand pedestrian traffic, push carts, scissor lifts, etc. Similarly, when it comes to acting as a moisture barrier, a continuous, sealable connection is needed to prevent water infiltration. This may include a means to help channel rainwater away from the joint and toward predetermined drainage points. Either way, the system needs to prevent water infiltration, which could do damage to the filler and cover system first and then go on to damage other areas of the building.

Water and moisture control are particularly important if the expansion joint is in a fire-rated assembly since the joint filler and cover will need to be fire rated as well. The apparent paradox of providing an intentional break in the structure to allow for normal expansion and contraction while still maintaining a fire rating is addressed by providing an expansion joint fire barrier that is tested for performance. However, since these fire barriers become worthless if they are wet, preventing water from entering a fire barrier is also critical to life safety. In that regard, choosing a supplier for expansion joint systems and fire barriers that are truly effective cannot be overstressed.

With all of the above in mind, there are three common types of barrier expansion joint systems that can be considered. The suitability of each for a particular project condition will depend on the size of the joint or gap as well as the conditions which the joint are subjected to.

Compression systems are typically for 4-inch and smaller expansion gap widths. These products are commonly comprised of mineral wool strips held in place through compression. These are topped with sealant to secure the barrier in place and protect it from water infiltration. For fire rated versions, fire lab testing of compression systems is typically done for both concrete and drywall conditions.

Foam seals are suitable for 6- to 8-inch and smaller gaps and conditions where abuse is not likely. In certain applications, the use of foam seals in expansion joints provides a solid seal against the elements, providing both thermal and moisture protection. Open-cell foams provide some breathability and are best in vertical applications, allowing any moisture that becomes trapped in a wall cavity to wick out. Closed-cell foams are watertight and block water from entering—whether in liquid or vapor form. This is the best application for horizontal runs where water could penetrate and pool where it is not wanted.

Continues at ce.architecturalrecord.com

***Peter J. Arsenault**, FAIA, NCARB, LEED AP, is a nationally known architect, consultant, continuing education presenter, and prolific author advancing building performance through better design.*
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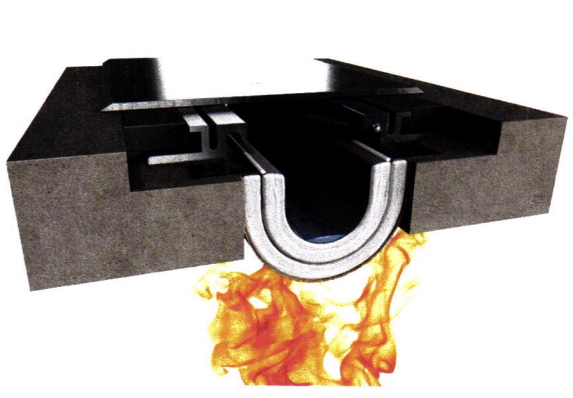


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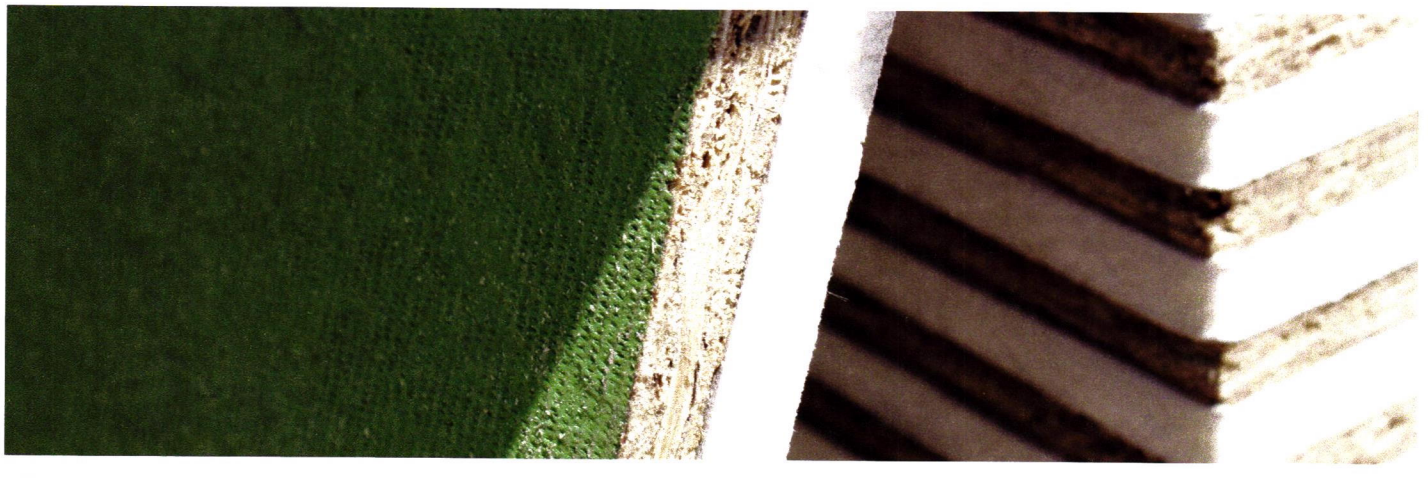


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Michael Albany Photography LLC.

Design for the Public Realm

A variety of products provide options for flexibility

Sponsored by B-K Lighting, Bison Innovative Products, and Western Red Cedar Lumber Association

By Elena M. Pascarella, RLA, ASLA

Over the past decade, there has been a renaissance in the design and construction of the public spaces in many major cities. This renaissance has resulted in the creation of new plazas, parks, pedestrian streets, and waterfront areas in our cities. These public spaces help to enhance the experience of urban social and cultural life. But what are the elements and components of these public spaces that make them successful and provide enticing public spaces for users?

Designing for the public realm is essentially placemaking. The Project for Public Spaces is a nonprofit organization that has spent more than 40 years developing guidelines for making successful public spaces. In its work, it has developed a chart that outlines the qualities that make public places successful. Successful places share four qualities: they are accessible, comfortable, present a good image, and provide a place for sociable contact and people to engage in activities. This course will examine key features and characteristics of public spaces and provide insight regarding appropriately sourced materials that can be used in designing these public spaces to enhance user experience and provide designs that enrich the social experience.

Public outdoor spaces can provide experiences in outdoor dining, active outdoor activities such as poolside recreation, or just relaxing and taking in the surrounding landscape. In addition, attractive public spaces can greatly increase the appeal, value, and marketability of nearby commercial and residential properties.

Urban areas and large cities do not always have large tracts of land available for public use. Many communities and organizations are moving toward creating small pocket parks and pop-up parks that provide flexible outdoor experiences on smaller tracts of land, thus allowing for more public outdoor spaces to be developed in their neighborhoods.

In designing these pocket parks, pop-up parks, and decks, pedestal systems and other modular products can provide architects and designers with greater design flexibility. Rooftop gardens in particular are a growing trend, as more and more urban areas are passing mandates requiring green roofs on commercial buildings over a certain size. Modular wood tiles and pedestal deck systems are two products that provide design flexibility with respect to location and layout.

CONTINUING EDUCATION

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Learning Objectives

After reading this article, you should be able to:

1. Describe the sustainability criteria (LEED and SITES) that apply to the design of exterior spaces and outdoor rooms.
2. Discuss the various products and systems that are available for designing exterior spaces for the public.
3. Explain some of the key safety considerations in designing public spaces.
4. Describe how lighting can enhance the public's nighttime experience and also provide safety.
5. List the ways in which exterior spaces meet LEED requirements of human health and well-being.

To receive AIA credit, you are required to read the entire article and pass the test. Go to **ce.architecturalrecord.com** for complete text and to take the test for free.

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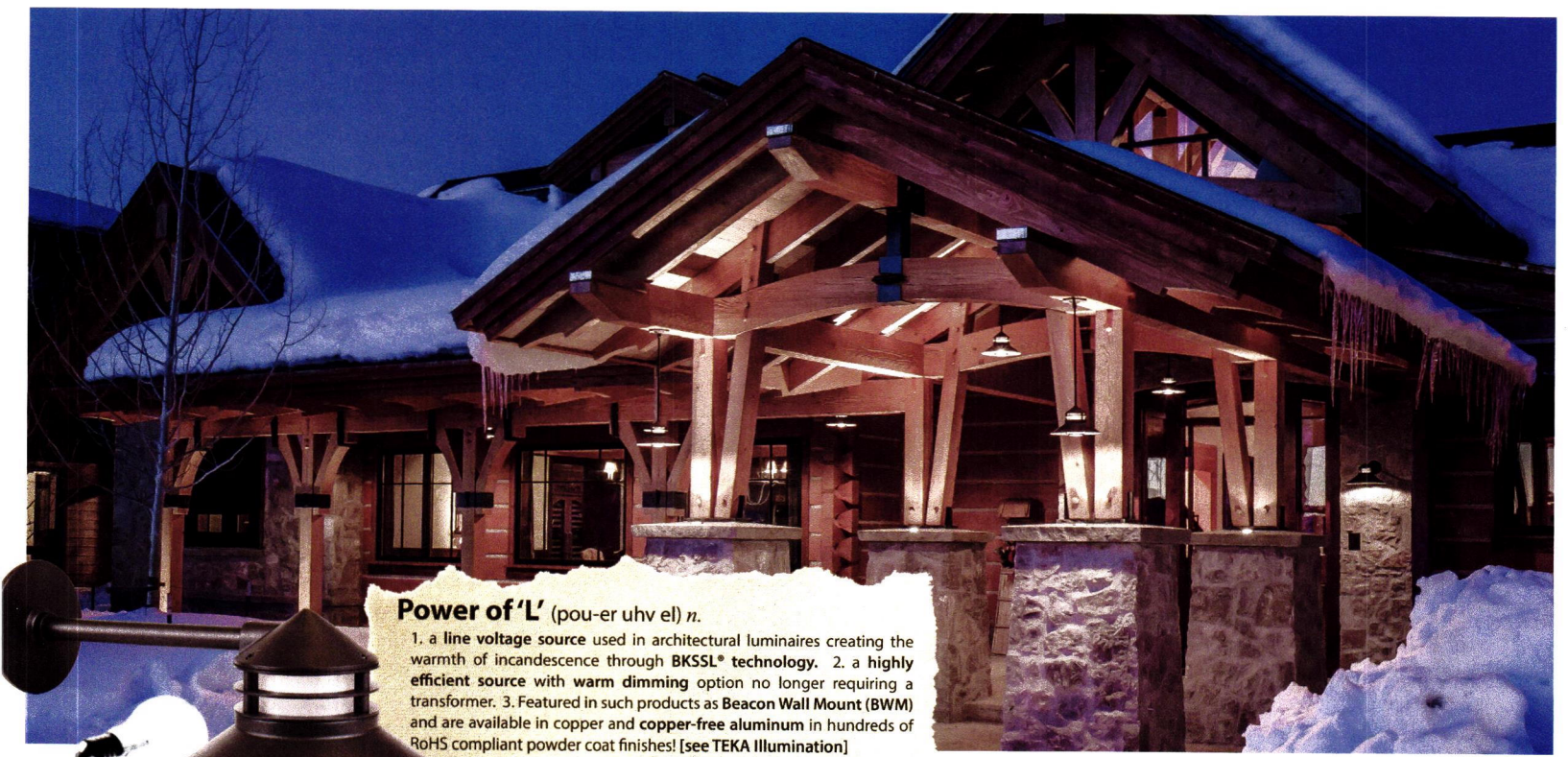


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What will inspire you?

ADJUSTABLE PEDESTAL DECK SUPPORT SYSTEMS

Offering tremendous design flexibility coupled with ease of installation, adjustable pedestal deck systems provide a unique and viable alternative to traditional deck building materials and methods. Pedestal deck systems can be utilized over any structural surface in a variety of locations whether for structural decks on bare ground, to support rooftop decks over roof membranes, to create green roofs, to support modular tiles over ground-level plazas and terraces, or to support modular tiles over a pavement or a pool surround.

Pedestal systems are made with high-density polypropylene plastic (comprised of 20 percent post-industrial recycled content) that are 100 percent recyclable. Pedestals can elevate and support wood tiles, concrete pavers, site furnishings, and a variety of other surfaces when sophisticated, commercial-grade decking is required. These pedestal systems are available in a range of heights and weight-bearing capacities to suit a variety of applications. Residential, commercial, and industrial grades each have different characteristics.

Adjustable pedestal supports are designed to elevate a variety of substrates, including granite or concrete pavers, wood tiles, composite materials, fiberglass grating, or conventional wood truss systems. In addition, pedestal systems can support decks over occupied space, allowing space for electrical systems, duct work, and irrigation. The pedestal heights can range from ⅛ inch to 36 inches in height. (Note that heights above 30 inches require railings to comply with code, and the decking systems do not come with railings so designers should include some type of perimeter containment to meet code requirements.) Through a pedestal system, elevations ranging from ⅛ inch to 36 inches in height can be attained and adjusted by the millimeter. The range in heights is achieved through the use of fixed and adjustable pedestal types of varying heights and weight-bearing capacities. There is a pedestal system to accommodate commercial, industrial, and residential products. Weight-bearing capacity per pedestal ranges from 750 to 1,250 pounds. Bracing accessories are required for pedestal systems over 24 inches in height. Additionally, there is a joist top accessory that can be used to convert the pedestals into traditional joist and plank decking supports.

The pedestal system is one of the most labor- and cost-efficient methods of creating a flat, level deck over a sloped surface. It is important to select a pedestal that features base levelling. These adjustable deck support systems are impervious to water, mold, and freeze-thaw cycles. Deciding which systems to specify is dependent on the support and elevation requirements of the installation; however, the supports can be used to create outdoor spaces in a variety of sizes and locations. Pedestals containing 20 percent or more post-industrial recycled material could contribute to multiple points within Materials and Resources Credit 4.

Modular Wood Tiles

Modular wood tiles provide a decking surface for exterior roof decks and pop-up parks. The tiles come in a variety of sizes, including 2-by-2-foot, 2-by-4-foot, 2-by-6-foot, 2-by-8-foot, and 30-by-30-inch units. Each modular tile has top planks and bottom runners that are held together with stainless steel screws that are inserted from the bottom so that the fasteners are not visible on the surface. The modular wood tiles are integrated with a pedestal system, and there are tabs on the pedestal that hold these surface paver units in place. Wood tiles are lighter than concrete or stone pavers, and the hardwoods used in fabrication of the wood can be refinished unlike composite materials. A fastening kit connects all of the pieces to create a monolithic surface.

The wood slats are typically made from four species of South American hardwoods: ipê, cumaru, garapa, and massaranduba. These wood species were selected for their durability as they are among the hardest and densest of wood species. Many of the wood tiles are available in Forest Stewardship Council (FSC) certified species. Garapa and massaranduba are only available as FSC-certified wood species. As modular wood tiles can be FSC certified (FSC-C13454), ipê, cumaru, garapa, or massarunduba wood tiles could contribute to LEED points under Materials and Resources Credit 3.

The 2-by-2-foot wood tiles are also available as fused bamboo tiles. The bamboo is manufactured through a fused process that combines two stages of high heat to carbonize the bamboo. This removes all of the starch and sugar in the bamboo and then restructures the wood by reinforcing its natural strength characteristics. The modified bamboo strands are fused together using a phenolic resin, which is the same resin used in making bowling balls. This process results in an extremely dense and durable product for exterior use.

All of the wood tiles are harvested in an environmentally responsible method designed to preserve the economic viability of rainforest hardwoods. The wood tiles are made from tropical hardwoods that contain a rich variety of graining and coloration, are exceptionally dense, and resistant to insects. These commercial-grade, responsibly harvested wood tiles weather well and are available in a variety of species. The density of tropical hardwood species make for minimal maintenance. If maintaining the wood color is desired, wood tiles can be periodically cleaned and sealed. Left to weather naturally, the wood tiles will develop a silvery-gray patina.

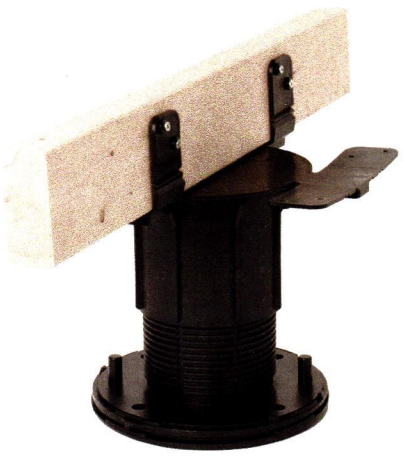
Wood tiles come with a five-year limited warranty against manufacturing defects. The wood tiles are ADA compliant, as the surface texture and spacing between the units meet ADA criteria. The wood tiles meet industry standards and certifications for wind uplift resistance, fire resistance ratings, slip resistance, and weight bearing capacity. With respect to seismic requirements, bracing accessories for the pedestals are available. The pedestal support system can be paired with a specialty fastening kit to prevent wind uplift in high-velocity zones. All wood tiles are tested for slip resistance, hardness, and fire rating in accordance industry standards and certifications.

Wood tiles are ideal for blending the warm beauty and upscale appearance of real wood with durability and low maintenance. Weighing one-third as much as concrete tiles, wood tiles are a good alternative when surface material weight is a factor. The tiles can be laid in a parquet or linear pattern, or mixed with pavers, river rock, stone, plank decking, or other options to create unique aesthetics.

Design Flexibility

Design flexibility in decking systems can be attained by adjusting the pedestal system heights to compensate for a range of heights and slopes or through a joist and plank accessory used in conjunction with the pedestals. The joint-plank accessory attaches to the top of the pedestal. The accessory is made of the same high-density post-industrial recycled content as the pedestals and has eight flaps, two on each side. The flaps fold up and will hold a joist of either 2-inch-by or 4-inch-by lumber. Wood plank decking can then be set on the joists just as with any traditional joist system.

Image courtesy of Bison Innovative Products



Shown is a joist top accessory on an adjustable pedestal.



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Stealth Cabin, courtesy of superkül. Photography by Shai Gil Fotography.

Photo courtesy of Bison Innovative Products



The Denver Museum of Contemporary Art uses adjustable pedestals to support custom plank decking, creating this stunning deck.

Pedestal systems can provide flexibility through a leveling capacity that compensates for slopes and changes in grade. Through this levelling system, elevations can be adjusted in height by the millimeter. This allows the designer to create outdoor decks and plazas in a variety of challenging locations.

The three types of pedestal deck support systems are all adjustable for height and can accommodate slope. Pedestals systems are manufactured for three types of projects: residential, commercial, and industrial grade. The pedestals for each of these project types can accommodate almost any type of surface material, are all 20 percent post-industrial recycled content, are all impervious to water, mold, and freeze-thaw cycles, and are all made in the United States.

The industrial-grade adjustable pedestals can reach heights from ⅛ inch to 36 inches, have a 1,250-pound weight-bearing capacity, and contain built-in slope compensation from 0–½ inch per foot slope (0–4 percent). Accessories are available to compensate for additional slope. Pedestal heights from 24 to 36 inches require bracing. There is a joist top accessory that can convert the pedestals into traditional joist and plank decking supports. Low fixed-height stackable pedestals can be used when low clearance is needed.

Industrial-grade and commercial-grade pedestals are designed to support heavy pavers over any waterproofed structural surface. The commercial-grade pedestals range from ⅛ to 36 inches in height. Couplers can be added to the adjustable pedestals to extend up to 36 inches in height. Pedestal heights from 24 to 36 inches require bracing. The weight-bearing design capacity of the commercial-grade pedestal is 1,000 pounds per pedestal.

The industrial-grade and commercial-grade adjustable pedestals give maximum design flexibility for a variety of surface materials, including wood deck tiles, concrete pavers, and more. Wood decking tiles supported by adjustable pedestals can be integrated seamlessly to create a roof deck system that is as simple as it is beautiful. All of the pedestal feature precise spacer tabs allowing for deck drainage, and the screw-to-adjust height setting on adjustable pedestals assures a perfectly straight and level deck.

A residential-grade pedestal deck system is suitable for any project type from commercial to residential. One simple pedestal model covers heights from 2–4¾ inches. Additional accessories are available to compensate for slope and accommodate heights from ⅛ inch all the way up to 12 inches. This model also supports up to 750 pounds and is the preferred system for do-it-yourself homeowners.

All of these adjustable pedestal models utilize a threaded design, making the leveling process during installation a simple turn of the pedestal base. This allows contractors, designers, and installers to accurately plan, precisely align, and uniformly install level decks with a combination of ease, speed, and accuracy. Spacer tabs ensure accurate spacing, lock the pavers in place, and allow water to drain. The pedestals have a broad footprint that provides stability, is impervious to freeze-thaw cycles, and offers a range of heights suited to almost any application.

FLEXIBILITY WITH SITE FURNISHINGS

Modular site furnishings provide flexibility in designing tight outdoor spaces, particularly with roof gardens and small pop-up parks, such as the one in the Cedar Rapids, Iowa site. Modular cubes can be used as planters seating or storage units and can be fabricated from aluminum or ipê wood. These cubes are available in an array of colors and finishes, and due to their material contents, they can contribute to LEED points (recycled aluminum and FSC-certified wood species). The modular cubes are used in place of a modular wood deck tile. The modular aluminum cubes are made in the United States, have a low-VOC finish that meets FAA reference test method 24, ASTM D2369 for determination of volatile content, are available in a metal or powder-coated finish, contain 20 percent recycled content, and are 100 percent recyclable. Many sizes and colors are available per custom order, thus providing flexibility for the designer.

Well-designed public spaces that utilize sustainable and renewable materials benefit the overall environment as well as the local community. And in designing public spaces, it is important to select quality materials that are durable to the outdoor elements as well as public use.

APPROPRIATENESS OF WESTERN RED CEDAR FOR PUBLIC SPACES

Western red cedar has long been known for its durability. Its botanical name is *Thuja plicata*, derived from *thujaplicin,* which is a chemical substance that is found in these trees and serves as a natural fungicide, thereby preventing the wood from rotting. Hence, its durability lies in its natural resistance to rot, decay, and insects.

Western red cedar is also a sustainable, resilient tree species. It has one of the widest growth ranges on the West Coast, as it grows in lush forests and mountainsides as well as many forested swamps and stream banks within its range. "Western red cedar is one of North America's great renewable resources. The range of western red cedar is essentially in two segments: a Coast Range-Cascade Range segment from southeastern Alaska to northwestern California and a Rocky Mountain segment from British Columbia and Alberta to Idaho and Montana." Although the species is slow growing, it is naturally durable and has one of the longest life spans of any North American softwood. According to U.S. Forest Service reports, this species tolerates shade very well and thus can survive in forest understories. In addition, U. S. Forest Service predictions indicate that this species' growth rates are likely to thrive as accelerated climate change occurs.[1]

Western red cedar also has a broad range of aesthetic qualities, making it a popular choice in design applications. It is pitch and resin free, which means that it accepts and holds a variety of finishes. Western red cedar provides both color and texture for projects, as it has naturally rich tonal properties, and the knotty grades of decking and siding add textural enhancements to designs. Paul Mackie, known as "Mr. Cedar" in the building industry, is an expert in the properties of western red cedar. In his opinion, "Western red cedar is simply one of the world's most beautiful woods. No man-made material can duplicate its naturally luxurious appearance."

And Corey V. Martin, principal at Hacker Architects, states, "Cedar creates spaces that other materials cannot. Without it, the fundamental form or volume would not have the same power. Western red cedar allows the buildings to be of the land in a perfect way—the building, land, and material can be one."

WESTERN RED CEDAR'S ENVIRONMENTAL APPROPRIATENESS

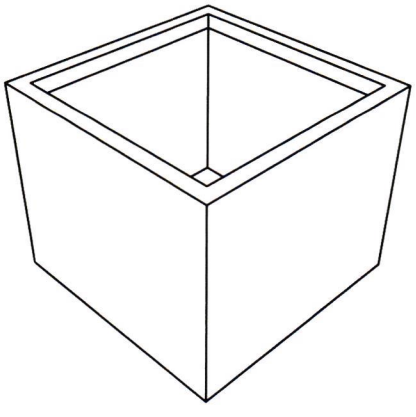
Climate change and impacts made by continued development are adversely affecting the environment and in turn our communities and health. By adhering to LEED and SITES criteria in designs, design teams can effectively reduce these impacts by specifying products that have been verified for improved environmental life-cycle impacts. Products whose manufacture or harvesting reduce negative environmental impacts can be certified as environmentally friendly. Western red cedar is third-party certified environmentally friendly in the way that it's harvested and its forests are managed.

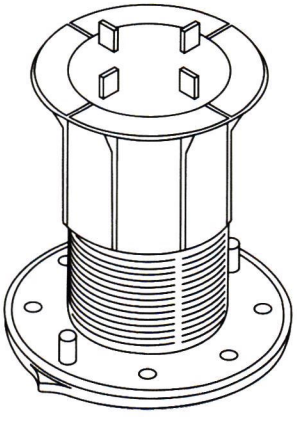
Over the past 15 years, the green building industry has invested a significant amount of resources to responsible procurement of forest products. The U.S. Green Building Council (USGBC) encourages the use of construction

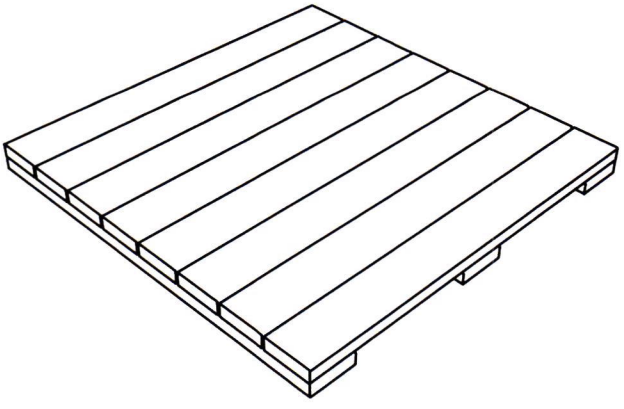
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CREATING ROOFTOP ENVIRONMENTS

project: Partners Healthcare Administrative Campus (Boston, MA) | architect: Gensler | landscape architect: OJB Landscape Architecture | photographer: Kyle J Caldwell







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products and materials carrying environmental product declarations (EPDs), which are calculated through a life-cycle assessment (LCA). The LCA is evaluated through the LEED Green Building point system. EPDs contribute to LEED points. EPDs are created according to internationally harmonized standards and are third-party verified, ensuring that the results for the product are valid. Products with third-party certification (Type III), including external verification, are valued as one-half of a point for credit achievement calculation through LEED. According to its website, the USGBC recently developed a new pilot alternative compliance path (ACP) credit for its LEED rating system. The ACP is designed to further advance environmentally responsible forest management and help to remove the use of illegal wood by promoting responsible wood sourcing and chain of custody.

The green characteristics of any material is the LCA which is a detailed analysis that provides guidance on the environmental friendliness of a product throughout the product's design. According to Dassault Systèmes, the company that makes the automated LCA tools, "The (LCA) analysis looks at a product's entire life, which encompasses extraction, material production, manufacturing, product use, end-of-life disposal, and all of the transportation that occurs between these stages."

LCA studies can provide the designer with comparisons of multiple material types. Some recent studies done by the research laboratory FPInnovations-Forintek have compared the benefits of the Western Red Cedar wood species *Thuja plicata* against non-wood building materials for residential siding and decking. The studied materials included products such as wood-plastic composite, fiber-cement materials, and extruded vinyl. This LCA study measured these products in areas such as resource and water use, energy requirements, transportation implications, and waste creation. The natural wood showed substantial advantages for sustainable design. John Wagner, a sustainability consultant and editor in chief of *Green Builder Magazine*, has acknowledged that the LCA comparative study showed western red cedar to be the least environmentally "burdensome" and lowest consumer of nonrenewable resources such as fossil fuels.

WESTERN RED CEDAR IN PUBLIC PLACEMAKING APPLICATIONS

Environmental considerations are only a part of the multifaceted design analysis conducted by project teams when determining the best materials for a given application. The design and construction of public-realm spaces call for materials that are low maintenance and durable to meet diminishing public maintenance budgets. Western red cedar's consistent density and ability to lay flat make it an appropriate material in the construction of both a safe and aesthetically attractive public environment. The ability to lay flat allows for crisp, clean surfaces to be created that will not warp or check and thus create unsightly and unsafe surfaces. Its density and durability make it an appropriate material for creating an outdoor shade pergola or arbor or providing an attractive fence to delineate the public space.

Aesthetic considerations and human interaction are not part of the protocols for life-cycle assessments or maintenance of products, but aesthetics and human interaction are important considerations in design projects. Aesthetic qualities contribute to what people find attractive about a place. "People who like being outdoors usually like being part of their natural surroundings," says Paul Mackie of WRCLA, articulating the appeal of natural products as compared to the synthetic character of some composite wood materials. "If that's the case, choosing a natural product like cedar is the way to go," he adds. "People who like to be outdoors or closer to nature prefer to spend time with all-natural materials."

Social ecologist Stephen R. Kellert has studied the science of biophilia and has authored a book on the subject titled *Biophilic Design*. The book lists 75 attributes to what is termed "restorative environmental design." The attributes include natural materials, natural shapes and forms, and natural patterns and processes. Western red cedar provides an aesthetically pleasing material for construction. The exposed wood grain and knots present natural shapes and forms, the natural textures present natural patterns, and the wood is a natural material. In addition, some architects and designers integrate the various cuts of wood, alternating flat and vertical grains for visual effect.

Western red cedar feels soft to the touch and never overheats, whereas synthetic decks can feel scratchy and have a tendency to get uncomfortably hot. The cool-touch, smooth surface characteristics are optimal for outdoor pool decks, condominium roof decks, or other public spaces where bare feet may come in contact with the deck surface.

Western red cedar has been used on a variety of public projects due to its durability, natural resistance to rot and insects, attractive texture, ability to hold a wide variety of finishes, and even the calming effect that wood has on people. Western red cedar has been specified as a preferred material for boardwalks, outdoor pavilions, rooftop decks, and site furniture. Some examples of its many uses are featured in case studies throughout this course.

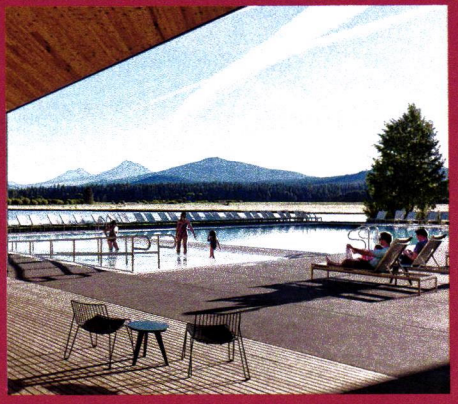
ILLUMINATING THE PUBLIC REALM

Studies have shown that there are traditionally three general categories of lighting for public spaces. The three categories include street lighting for safety and convenience, decorative or festive lighting for special occasions, and architectural lighting used to accentuate important buildings, spaces, and monuments. The first lighting category is usually required by

LAKESIDE AT BLACK BUTTE RANCH, BLACK BUTTE, OREGON

Portland-based architecture firm Hacker won several accolades at the Wood Design Awards for the cedar-rich Black Butte Ranch project. The goal for the project was to revitalize the heart of the ranch, giving new life to the original main lodge and pool area, and setting a new standard for resort design in the region. The challenge was honoring the site, which is a sublimely beautiful volcanic landscape where visitors can see newly formed land before it was eroded by time. The area borders the moist climate of the Cascade Mountains to the west and the crisp, dry air of the high desert to the east.

"Such a beautiful and pristine site presents a profound responsibility to design buildings that not only complement but also enhance their surroundings," says Corey V. Martin, design principal at Hacker. This deep appreciation for the land led Martin and his team to ensure all aspects of the project minimized energy use and environmental impact. They achieved this by integrating green technology systems and, of course, choosing wood from sustainable resources.[2]



The lakeside deck at Black Butte Ranch features western red cedar.

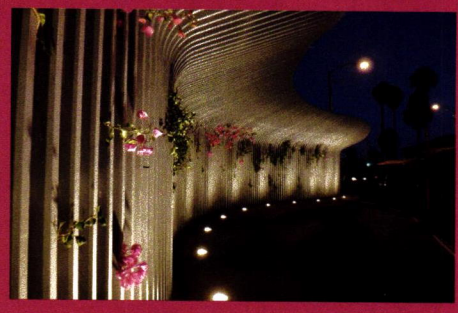
© Jeremy Bittermann

Photo by Clifton Manahan, Horton Lees Brogden Lighting Design

TONGVA PARK, SANTA MONICA PIER, CALIFORNIA

Once a very large parking lot, the 6-acre Tongva Park is the collaborative result of community-based research, planning, and design by James Corner Field Operations, Horton Lees Brogden Lighting Design, the City of Santa Monica, its residents, and many others. The park includes a wide range of multiuse areas, including a garden walk with meandering paths, public art spaces, water features, and a play area for children that incorporates a water activity splash pad.

The gracefully transformative lighting design provided by HLB provides both safety and beauty, as 30 floodlights and 100 recessed ground fixtures highlight the artistic and unique architectural features of the park. "These fixtures were chosen for LED color quality and consistency, fixture longevity, and flexibility in aiming and optics," Manahan says.



The lighting design at Tongva Park provides both safety and aesthetics using energy-efficient LED fixtures.

The photo provided by Manahan is a closeup of one of these unique features that also serves as a seating area. The floodlights provide the uplighting for this bougainvillea-laced green wall rooted on the park side just behind. The sitting wall is actually located on the exterior edge of the park, which is fixed at the corner of Ocean and Colorado Avenues, barely southeast of the infamous neon Santa Monica Pier gateway that is visited by millions each year.

code. The second and third provide an aesthetic element while enhancing safety. A strategy for illuminating public spaces should consider both safety and aesthetics and may include all three categories of lighting in the design approach. A well- designed lighting strategy can help bring a sense of animation to a public space and extend its use into the evening.

Newer approaches to lighting design for public spaces are focusing on a holistic approach with more emphasis on designing lighting for people and moving away from the current standards and recommendations that come from a vehicular-based vantage point. Nancy E. Clanton, PE, IALD, FIES, LEED Fellow, president of Clanton & Associates, states, "Too often, we still think of public lighting's role as allowing motorists to detect pedestrians. Walking pedestrians and cyclists are more vulnerable; where they look and what they need in a lighted environment is completely different from motorists. Intuitively, we know that pedestrians need to detect sidewalk hazards, see destinations and attractions, recognize people, and generally feel safe.[3]

Lighting designers have a wealth of new technology that provide them with an infinite means for providing public spaces with multiple layers of light by combining ambient lighting, focal point lighting, and colorful accent lighting. Previously, lighting designs considered uniform light to be the standard requirement for safety. Newer approaches use contrast to make a space both safer and more interesting to the user. Recent studies done by Nancy Clanton and Ron Gibbons "have shown that lowered light levels can provide greater contrast, and this contrast can actually improve detection and visibility. In addition, the introduction of LED lighting has given us the ability to precisely focus light on the relevant areas instead of "bathing" a space in light."[3]

This recent shift in approach stems from recognizing the needs of pedestrians in communities and especially in urban areas that are increasing in population. It also is a direct outcome of global efforts to reduce CO2 emissions and the shift from car-focused vehicular transportation to more mass-transit transportation, which naturally generates more pedestrians and cyclists within the public realm. The trend toward transit-oriented developments and walkable cities puts greater demand on designing public spaces that enhance the pedestrian experience and provide "lighting for people."

Image courtesy of B-K Lighting



The 360-degree mounting system provides flexibility with aiming and maintaining the direction of a light.

Lighting for People

There are many types of lighting products that can assist designers in lighting public spaces, including floodlights, downlights, architectural surface lights mounted on building exteriors, recessed in-grade lights and uplights for uplighting site features and monuments, bollard lights, path and area lights, and step lights. This variety of products provides the designer with a palette of lighting tools for creatively illuminating public spaces.

With a focus on lighting for people, the aim or angle of the light is important so that glare is not created. The most discriminating lighting design can be degraded by bad aiming or the fixture's lack of ability to maintain its aiming position. A light with a 360-degree mounting system can solve both of these problems. By combining several mechanical, engineering, and design techniques, a 360-degree mounting system creates an aim-and-lock technology.

The 360-degree mounting system is made up of three machined aluminum components: the short knuckle, the long knuckle, and the mounting nipple, along with two stainless steel, hex head, aiming lock screws and four high-temperature 'O' rings. The short knuckle mounts to the back of the fixture and incorporates an 'O' ring to ensure a positive seal between the knuckle and the fixture housing.

Continues at ce.architecturalrecord.com

***Elena M. Pascarella**, RLA, ASLA, is a practicing landscape architect, continuing education presenter, and consultant engaged in a private practice based in Rhode Island. The firm's portfolio can be viewed at **www.landscapeelementsllc.com**.*

BISON Innovative Products

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PRODUCT REVIEW

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www.bklighting.com/DE

Bison Innovative Products



Image courtesy of Bison Innovative Products

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www.realcedar.com

Expansion Joint Fire Barriers: Principles, Practices, and Problems

Sponsored by Inpro

There is more to an expansion joint system than just the frame and covers. This webinar deals with the life safety specifics of fire barriers, industry standards, and testing. In addition, it covers installation concerns, proper detailing of fire barriers, and the current state of joint system verification

An expansion joint is an opening within a structure, at a predetermined location, designed to absorb movement of the structure. A fire barrier is an assembly used to prevent, fire, smoke, and heat transfer from penetrating an expansion joint opening for a specified rating period. Joints and slab openings inherently create a pathway for fire and smoke to spread throughout the structure. Fire barriers exist to keep the threat contained to provide for life safety through a means of egress.

The ultimate goal is to limit liability and make sure your building and its occupants are not vulnerable to the hazards of fire, smoke, and heat transfer.

Continues at ce.architecturalrecord.com

CONTINUING EDUCATION

1 AIA LU/HSW

Learning Objectives

After reading this article, you should be able to:

1. Master a basic understanding of fire barriers as related to expansion joint systems.
2. Define industry-standard fire barrier types, ratings, and testing protocols.
3. Identify proper barrier detailing of common building conditions.
4. Distinguish good barrier installations from those that increase vulnerabilities.
5. Examine system failure causes and their remedies.

To receive AIA credit, you are required to read the entire article and pass the test. Go to **ce.architecturalrecord.com** for complete text and to take the test for free.

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CONTINUING EDUCATION

Wood and Evolving Codes: The 2018 IBC and Emerging Wood Technologies

Building codes are evolving to support new technological developments for one of our oldest building materials

Sponsored by Think Wood | *By Andrew A. Hunt*

Increasingly, designers, builders, and building owners are turning to one of our oldest building materials: wood. Valued for its versatility, low carbon footprint, and aesthetic qualities, not to mention its cost performance, wood has long been a preferred choice for constructing durable structures that are resilient in the face of hazardous conditions. However, in modern times, structural wood has been largely confined to residential and low-rise commercial construction, despite its proven structural performance and ability to endure seismic and wind events. Recent innovations and subsequent code changes are expanding the use of structural wood beyond these established sectors.

Using wood in nonresidential buildings is not a completely new idea, but rather a revival. Innovative new construction techniques are expanding the use of lumber; these techniques utilize engineered wood products such as cross-laminated timber (CLT), nail-laminated timber (NLT), dowel-laminated timber (DLT), and structural glued-laminated timber (glulam). These "mass timber" products have great structural capability and inherent fire resistance, and interest in mid- and even high-rise wood buildings that incorporate these technologies is growing rapidly in Canada and the United States. Testing and validation of these products, in addition to many new examples coming online, is driving increasing confidence from both



Designers are taking advantage of innovative wood products that showcase the natural beauty of wood.

Photo: Jeremy Bitterman, courtesy of LEVER Architecture

CONTINUING EDUCATION

1.5 AIA LU/HSW

Learning Objectives

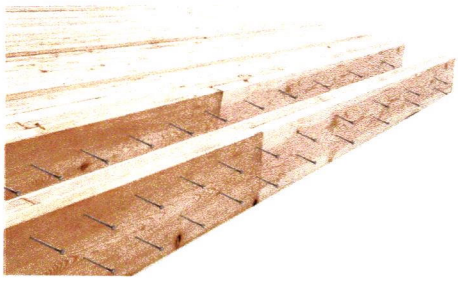
After reading this article, you should be able to:

1. Discuss provisions in the International Building Code (IBC) intended to ensure that wood buildings provide an acceptable level of safety.
2. Evaluate techniques that make it safe for designers to increase heights and areas of building projects beyond IBC base limits.
3. Identify the advantages of wood-frame and mass timber structures during hazardous events.
4. Explain how advances in wood products and building systems are influencing the evolution of building codes.

To receive AIA credit, you are required to read the entire article and pass the test. Go to ce.architecturalrecord.com for complete text and to take the test for free. This course may also qualify for one Professional Development Hour (PDH). Most states now accept AIA credits for engineers' requirements. Check your state licensing board for all laws, rules, and regulations to confirm.

AIA COURSE #K1806N

Image courtesy of Think Wood



Nail-laminated timber, which consists of dimension lumber stacked on edge and nailed together, is one of several engineered wood products being used in today's buildings.

the public and local code authorities. Recent code changes reflect the growing body of research that validates these systems for structural performance and for contribution to life safety during extreme events, such as fires, hurricanes, and earthquakes.

THE CODE UPDATE PROCESS

When the International Building Code (IBC) was introduced in 2000, it consolidated three regional model building codes into one uniform code that has since been adopted by most jurisdictions. It increased the possibilities for wood construction by (among other things) recognizing additional fire protection techniques, consolidating the maximum allowable areas and heights from the three legacy codes into one (thus increasing what's allowable in some jurisdictions), and allowing the use of wood in a wider range of building types. In subsequent versions of the IBC, even more opportunities have been created where additional fire protection features are used. Even so, the pioneering nature of building design is such that there are always architects and engineers seeking to innovate, and it is common for project teams to request (and be granted) variances for designs not covered by the code that nonetheless meet its intent and provide accepted levels of safety. Given the code's three-year amendment cycle, this performance pathway is necessary to keep pace with advancements in building systems, materials, and construction practices.

The 2018 IBC was recently published, and states and local jurisdictions will soon begin adopting it; however, the code landscape is uneven, and many states and jurisdictions are following IBC 2015, 2012, or even older versions of the code. The 2018 IBC references newer versions of important standards. One of these is ANSI/AWC NDS-2018: National Design Specification for Wood Construction. Produced by the American Wood Council (AWC), this resource was first issued in 1944. Today, it includes requirements for design of a full range of wood products based on up-to-date research and testing, and it is used to guide design of wood structures around the world.

NDS 2018 itself references ASCE 7-16: Minimum Design Loads and Associated Criteria for Buildings and Other Structures. This important resource, published by the American Society of Civil Engineers (ASCE), describes the means for determining dead, live, soil, flood, tsunami, snow, rain, atmospheric ice, earthquake, and wind loads, and their combinations for general structural design. It is widely referenced by building codes.

While the IBC is updated on a three-year cycle, the ASCE 7 is typically on a six-year cycle. The NDS is updated at least every six years, but sometimes more often to address new load provisions developed by ASCE 7 or new products such as CLT.

Advocating for Change

Although the International Code Council (ICC) and the building industry in general have long recognized the benefits of wood as a building material, emerging technologies such as CLT are still new to many people, and until the 2015 IBC, they were not explicitly introduced into building codes.[1]

It's important to understand that mass timber systems and technologies such as CLT have been fully tested and verified and are allowed under current codes. Fortunately, architects, engineers, developers, building owners, and others are championing CLT and other new uses of wood, including light frame, and sharing resources and research to support this burgeoning interest in mass timber building design, including the use of wood in taller buildings. The Think Wood Research Library, an online database that includes nearly 1,000 research documents, can help architects, engineers, and other industry professionals design and build safe, high-performing wood structures. The research contained in the database covers seismic, fire safety, and other performance aspects of wood members and systems. The library also includes reports and research papers on other design topics, including acoustics and vibrations, energy and environment, and building codes and cost.

Another specific resource for designers seeking to design code-compliant wood structures is the 2015 Code-Conforming Wood Design (CCWD). Produced in partnership with the ICC, the AWC developed this document to demonstrate that modern building codes allow large, multistory wood buildings in many common occupancy uses with nothing more than a basic understanding of key code provisions required. CCWD summarizes the most common requirements for wood construction in commercial buildings according to the 2015 IBC. A new version of CCWD based on the 2018 IBC is currently in development.

In this quickly evolving industry, a number of individuals and entities, including engineering firms, academic institutions, standards organizations such as the National Fire Protection Association (NFPA), and government research organizations such as the U.S. Forest Service Forest Products Laboratory, have been driving innovation with testing that demonstrates and improves upon the structural, seismic, wind, and fire safety performance of mass timber. These efforts have led to a great deal of new information in a short period of time, and these groups are committed to sharing this information in order to drive best practices in this emerging field.

To promote and facilitate code changes based on the building science of taller wood buildings, the ICC approved the creation of the Ad Hoc Committee on Tall Wood Buildings in 2016. This balanced group includes building officials, fire officials, architects, fire protection engineers, and industry experts. "Tall wood" is an industry term that refers to the use of wood products in buildings greater than six stories; hence, the committee was charged with investigating the feasibility of and taking action on developing code changes for tall mass timber buildings. Since its formation, the Committee on Tall Wood Buildings has reviewed extensive literature on tall wood buildings, including the results of domestic and international testing. The committee has proposed 14 code changes for the 2021 IBC cycle.[2] (A summary of these proposed changes can be viewed at www.awc.org/tallmasstimber)

Continues at ce.architecturalrecord.com

Andrew A. Hunt *is vice president of Confluence Communications and has been a writer and consultant in the green building and building science industry for over a decade. He has authored more than 100 continuing education and technical publications as part of a nationwide practice.* ***www.confluencecommunications.com***

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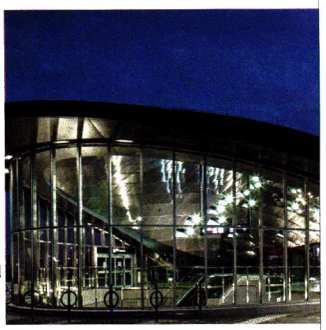
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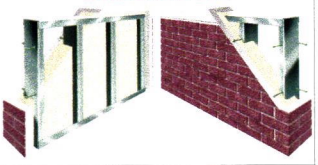
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New and Upcoming Exhibitions

Amsterdam Magical Centre: Art and Counterculture 1967–1970
Amsterdam
July 7, 2018–January 6, 2019
Featuring artwork from the museum's permanent collection, this exhibition displays conceptual artwork that was installed or shown in Amsterdam from 1967 onward, as well as tracking historical civic actions such as the city's squatter movement. Participating artists include Robert Morris, Dennis Oppenheim, and Lawrence Weiner. At the Stedelijk Museum Amsterdam. More at stedelijk.nl/en.

Toward a Concrete Utopia: Architecture in Yugoslavia, 1948–1980
New York City
July 15, 2018–January 13, 2019
This exhibition looks at the architecture of the former Yugoslavia through a survey of more than 400 drawings, models, photographs, and films that were sourced from regional archives held both by governmental entities and private collections. Work by architects such as Bogdan Bogdanović, Juraj Neidhardt, Svetlana Kana Radević, Edvard Ravnikar, Vjenceslav Richter, and Milica Šterić will be included in the show, the first of its kind to be staged in the U.S. At the Museum of Modern Art. For more information, visit moma.org.

SITElines.2018: Casa Tomada
Santa Fe, New Mexico
August 3, 2018–January 6, 2019
Named after Argentine writer Julio Cortázar's 1946 story "Casa tomada" ("House Taken Over"), the third edition of SITE Santa Fe's revamped biennial will feature 23 artists from eight countries with a focus on contemporary art from the Americas. Curated by José Luis Blondet, Candice Hopkins, Ruba Katrib, and Naomi Beckwith, the exhibition will include 10 new commissions from artists, including Lutz Bacher's large-scale work on the side of a building, Ángela Bonadies and Juan José Olavarría's examination of La Torre de David in Caracas, and an interactive sculpture by Eduardo Navarro. See sitesantafe.org.

Investigating Where We Live
Washington, D.C.
August 11 – December 31, 2018
The annual exhibit is the result of a five-week program where teens explore and document their interpretation of the city's residents and built environment through photographs, artwork, and writing. The young participants also design and install the exhibit. At the National Building Museum. More at nbm.org.

Treasures from the White City: Chicago World's Fair of 1893
Chicago
September 8–January 6, 2019
Held within a gallery that once hosted a reception for the World's Fair of 1893, this exhibit showcases original objects and memorabilia that were designed for and displayed at that international event. Highlighted objects include items from the respective pavilions of Tiffany & Company and Gorham Manufacturing Company, which were seen as groundbreaking for their use of silver production at the time of the fair. At the Richard H. Driehaus Museum. Visit driehausmuseum.org.

The Last Resort
Moscow
September 29, 2018–January 27, 2019
This site-specific installation by Berlin-based artist Anri Sala features 38 snare drums suspended from the ceiling as a contemporary reinterpretation of Mozart's Clarinet Concerto in A Major. At the Garage Museum of Contemporary Art. For more information, visit garagemca.org/en.

Ongoing Exhibitions

The Bibliothèque nationale de France: Portrait of a Project, 1988–1998
Paris
Through July 22, 2018
Commemorating the 20th anniversary of the Bibliothèque nationale de France, this exhibition—curated by its architect, Dominique Perrault—reexamines the project from its design to its furnishings, landscaped gardens, and place in what was a newly created neighborhood. Perrault includes films, sketches, plans, and models from both his own archive and public collections to reevaluate the well-known library. More information at bnf.fr.

Public Parks, Private Gardens: Paris to Provence
New York City
Through July 29, 2018
This exhibition focuses on the 19th-century boom in landscape design that transformed France's public spaces and personal gardens. The movement is illustrated through paintings, photographs, and various objects by artists, from the Metropolitan Museum of Art's collection. Details at metmuseum.org.

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How do we pronounce design in Portuguese? 2000–18
Providence
Through August 3, 2018
Portuguese academic institutions collaborate with the Rhode Island School of Design in a new program focused on the study of cork and softwoods for this exhibit examining how national identity is linked to material culture and the global market. The show presents a series of objects made by Portuguese designers. At the Sol Koffler Gallery. More information at risd.edu.

Now What?! Advocacy, Activism & Alliances in American Architecture Since 1968
Los Angeles
Through August 28, 2018
This exhibit examines how architects and designers participated in and responded to major social and political movements over the past 50 years, including those for civil, women's, and LGBTQ rights, beginning in 1968. At the A+D Museum (though the exhibit will travel to other unconfirmed venues across the country following the Los Angeles exhibition). More at nowwhat-architexx.org.

Lectures, Conferences, and Symposia

Australian International Furniture Fair
Melbourne
July 19–20, 2018
This year, the annual trade show catering to national retail chains and independent buyers features an exhibition of furnishings by more than 300 designers from Austrialia, New Zealand, and elsewhere. The event also includes seminars and an annual awards series. More than 11,000 visitors are expected to attend. More at aiff.net.au.

São Paulo Design Weekend
São Paulo
August 29–September 2, 2018
The largest design festival in Latin America, the five-day event includes over 300 planned activities and exhibits organized by local galleries, museums, and schools. Programming includes lectures, installations, and seminars. For more information, go to designweekend.com.br.

London Design Fair
London
September 20–23, 2018
Launched in 2007, the London Design Fair is a four-day trade show that features 550 exhibitors from 36 countries. The event showcases new work from both independent and established brands of materials, furniture, lighting, and textile design. See londondesignfair.co.uk.

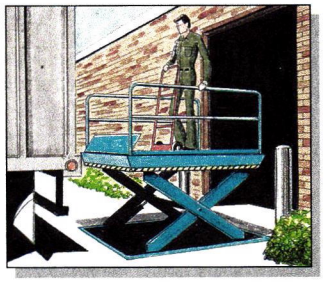
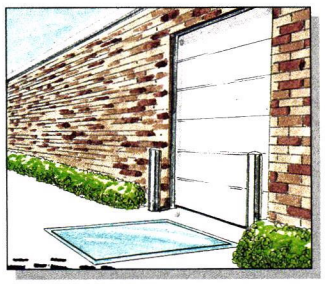
Competitions

Moorfields UCL Design Competition
Deadline: July 13, 2018
This professional design competition, administered by the Royal Institute of British Architects, seeks proposals from multidisciplinary teams for the design of a new integrated center to treat eye-related illnesses as well as provide spaces for research and education activities for Moorfields Eye Hospital and its partners CL Institute of Ophthalmology and Moorfields Eye Charity. More at architecture.com.

World Expos: Imagine Your National Pavilion
Deadline: July 18, 2018
This Archstorming competition seeks conceptual proposals for national pavilions no larger than about 107,000 square feet, accommodating any program or topic. Designers who were previously commissioned to create a Universal Exposition pavilion will jury, and four winning entries will receive cash prizes. Architects of all levels may apply, including students. More at archstorming.com.

HOME Competition 2018
Deadline: July 31, 2018
Run by Arch Out Loud, this competition invites designers to create proposals for the future of domestic architecture, focusing on the unit-level experience for residents. Participants may work in teams of two. Jury members include Bureau Spectacular's Jimenez Lai, The Living's David Benjamin, and Liam Young from Tomorrow's Thoughts Today. See thehomecompetition.com.

NOVA Design Award 2018: Future Living Space
Deadline: July 31, 2018
This inaugural competition, run by a Chinese property-investment and management company, asks what living environments could be like decades from now. The brief seeks design proposals for a single unit measuring about 540 square feet, with a maximum ceiling height of 19 feet—the typical size of a unit within the context of a Chinese city. More at nova-award.com.

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International Graduation Projects Award
Deadline: August 15, 2018
Organized by the Tamayouz Excellence Award, this competition assesses graduation projects by any architecture or urban planning student from any school worldwide. The winner will receive a two-year scholarship to the University Polytechnic of Milan, while second and third prizes include scholarships to travel to Jordan for a design workshop. See more at tamayouz-award.com.

Dewan Award for Architecture 2018
Deadline: August 25, 2018
This annual international competition invites proposals for a six-classroom primary school in Iraq's historic marshlands, at which students would arrive by car or boat. More information at dewan-award.com.

Switch: Guggenheim Museum, New York
Deadline: August 31, 2018
The jury asks participants to design a museum for the same site as the Solomon R. Guggenheim Museum's that would achieve a response similar to the one from the public in 1959 upon first seeing Frank Lloyd Wright's building. Visit switchcompetition.com.

The Rifat Chadirji Prize 2018: Baghdad Design Centre
Deadline: September 9, 2018
This annual competition, named for Iraqi architect Rifat Chadirji, seeks proposals for the renovation of a partially demolished, vacant building in Baghdad. What remains of the structure's damaged facades should be incorporated into the new structure, which will become a center dedicated to design. Organized by Tamayouz Excellence Award. More information at rifatchadirji.com.

Bruno Zevi Prize 2018
Deadline: September 10, 2018
This 12th annual essay competition seeks entries following Bruno Zevi's methodology of critical and historical inquiry to examine an architectural work, theme, or architect. The competition is open to any Ph.D. researcher studying topics related to architecture. More information at fondazionebrunozevi.it/en.

Shaking Up Havana's Malecón
Deadline: September 11, 2018
This competition asks participants to create a scheme for the adaptive reuse of the Malecón, a seawall, roadway, and celebrated promenade along the edge of the city of Havana. Entries should incorporate resilient-design principles as well as facilitate various kinds of cultural activities in the space. More information at eleven-magazine.com.

Seduction Pavilion
Deadline: September 12, 2018
This competition invites proposals for an architectural installation around 30 photographs of pinup models whose images were used in calendars sold to support American troops in World War II. The winning team will receive a cash prize, and their pavilion will be erected during the inaugural Fashion Film Festival in Bologna. Organized by the Fashion Research Italy Foundation and the Cineteca di Bologna. For more information, go to youngarchitectscompetitions.com.

Nisshin Kogyo Architectural Design Competition
Deadline: October 1, 2018
The 45th edition of this conceptual competition is based on the theme "living upon the history" (of a place) and asks participants to submit drawings reflecting their interpretation of the theme into architecture. Jurors include Ryue Nishizawa, Akihisa Hirata, and Ryuji Fujimura. For more information, see nisshinkogyo.co.jp/compe.

London Affordable Housing Challenge
Deadline: October 9, 2018
This competition seeks pilot-phase conceptual designs for an affordable-housing scheme that could be instituted throughout the city. Proposed housing should be flexible enough to accommodate a varying number of residents. Organized by Bee Breeders. More information at londonhousing.beebreeders.com.

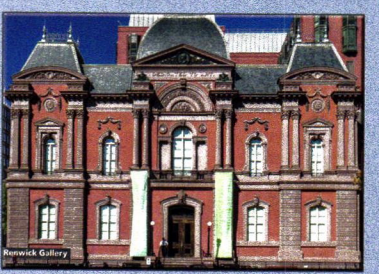
Silent Meditation Forest Cabins
Deadline: October 23, 2018
Participants are asked to create a prototype for a cabin to be occupied by a single resident in Latvia's countryside who will be practicing silent meditation. Designs should emphasize cost-effective and eco-friendly construction techniques. Organized by Bee Breeders. More information at silentcabins.beebreeders.com.

E-mail information two months in advance to areditor@bnpmedia.com.

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PROJECT LEEZA SOHO TOWER
LOCATION BEIJING
DESIGNER ZAHA HADID ARCHITECTS



LOOKING STRAIGHT UP from within the Leeza SOHO Tower's atrium—the tallest in the world—it really does seem as if the sky's the limit. The 50-story cavity, described by Zaha Hadid Architects (ZHA) project director Satoshi Ohashi as an "urban window," ascends between twin volumes, each comprising office space, that spiral upward "like dancers twisting out to the heart of the city," says Ohashi. Tied together by four ring-shaped belt trusses and unified by an exterior aluminum-and-glass curtain wall, which wraps around the two structures to marry them into a single rounded form, Leeza SOHO straddles a subway line that will connect the newly minted business district of Lize with greater Beijing as well as a forthcoming international airport, also designed by ZHA. The 2 million-square-foot skyscraper, one of Lize's first, topped out last September and will open in May 2019.
Alex Klimoski

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